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(Subjective) Time Heals All Wounds:

The Competing Roles of Objective and Subjective Time in Reactions to Past Events

by

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DISSERTATION

Submitted to the Department of Psychology

in partial fulfillment of the requirements for

Doctor of Philosophy in Psychology

Wilfrid Laurier University

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Abstract

Although folk wisdom states that “time heals all wounds,” the truth of this claim is questionable and may be contingent on the nature of time in question. People think about and represent time in different ways: they consider how far away events (objectively) are, as well as how close or far away they (subjectively) feel. How close or distant a temporal event feels from the present is quite malleable and can be affected by a host of psychological factors independent of chronological time. However, little research has explicitly investigated the extent to which objective, calendar time, and one’s subjective sense of time “heal all wounds.” We predicted that while the passage of objective time may help to alleviate distress about a past event to some degree, the feeling of subjective time from that event would predict emotional outcomes above and beyond any effect of objective time. That is, we expected that the “time heals all wounds” adage would be primarily true for subjective time. In four studies, we examine the contribution of these two representations of time in a variety of contexts, finding that in all studies, subjective time accounted for more variance than chronological distance from a past event as a predictor of present affect. Study 1a and 1b demonstrates how greater subjective distance predicts less intense present affect (over and above objective time) for both negative events (breakups, Study 1a) and positive events (birthdays, Study 1b). Study 2 explores how individual differences, such as attachment security, may act as antecedents of subjective time perception for a negative relational event, accounting for ways that subjective time diverges from objective time. The first three studies manipulated objective time and examined individual difference variance in subjective time; the final study manipulates both objective and subjective time. Study 3 establishes the causal link between subjective time and current affect, finding that experimentally induced subjective distance attenuates emotional intensity over and above objective distance. We

discuss how the distinct roles of objective and subjective time can be important for understanding how individuals engage in psychological healing over time, as well as potential interpersonal and societal implications.

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Table of Contents

Abstract	i
Table of Contents	iv
List of Tables	vii
List of Figures	ix
List of Appendices	x
Introduction	1
Defining Time and Healing.....	1
Does Objective Time Heal All Wounds?	2
Does Subjective Time Heal All Wounds?	3
The Mechanisms Behind Experiences of Time	6
Attention.....	6
Fluency.....	7
Objective and Subjective Time: How Are They Related?.....	8
Overview of the Present Research.....	10
Study 1a.....	13
Method.....	15
Participants	15
Procedure.....	16
Results and Discussion	18

Manipulation Check.....	18
Preliminary Analyses	19
Role of Objective and Subjective Time in Responses to Past Breakups	19
Secondary Analyses of Objective and Subjective Time	21
Study 1b.....	24
Method.....	25
Participants	25
Procedure.....	25
Preliminary Analyses	27
Effects of Objective and Subjective Time on Responses to Past Birthdays	27
Secondary Analyses of Objective and Subjective Time	28
Study 2.....	31
Method.....	32
Participants	32
Procedure.....	33
Results and Discussion	35
Preliminary Analyses	35
Effects of Objective and Subjective Time on Responses to Past Transgressions	36
Secondary Analyses of Objective and Subjective Time	37
Mediation Analyses.....	38

Study 3.....	41
Precursors to Study 3	42
The Present Study.....	43
Method.....	44
Participants	44
Procedure.....	44
Results and Discussion	46
Manipulation Checks and Preliminary Analyses.....	46
Effects of Objective and Subjective Time on Responses to Past Transgressions	49
Secondary Analyses of Objective and Subjective Time	50
General Discussion	52
Works Cited.....	59
Tables and Figures	68
Appendices	93

List of Tables

Table 1.	<i>Study 1A: Means, Standard Deviations, and Zero-Order Correlations with Subjective Distance</i>	68
Table 2.	<i>Study 1A: Regression Analysis of Objective and Subjective Time on Reactions to Past Breakup</i>	69
Table 3.	<i>Study 1A: Regression Analysis of Objective and Subjective Time on Reactions to First Breakup</i>	70
Table 4.	<i>Study 1A: Regression Analysis of Objective and Subjective Time on Reactions to Most Recent Breakup</i>	71
Table 5.	<i>Study 1B: Means, Standard Deviations, and Zero-Order Correlations with Subjective Distance</i>	72
Table 6.	<i>Study 1B: Regression Analysis of Objective and Subjective Time on Reactions to Past Birthday</i>	73
Table 7.	<i>Study 1B: Regression Analysis of Objective and Subjective Time on Reactions to Three Birthdays Ago</i>	74
Table 8.	<i>Study 1B: Regression Analysis of Objective and Subjective Time on Reactions to Most Recent Birthday</i>	75
Table 9.	<i>Study 2: Means, Standard Deviations, and Zero-Order Correlations with Subjective Distance</i>	76
Table 10.	<i>Study 2: Regression Analysis of Objective and Subjective Time on Reactions to Past Interpersonal Transgression</i>	77
Table 11.	<i>Study 2: Regression Analysis of Objective and Subjective Time on Reactions to Older Interpersonal Transgression</i>	78

Table 12.	<i>Study 2: Regression Analysis of Objective and Subjective Time on Reactions to Newer Interpersonal Transgression</i>	79
Table 13.	<i>Study 2: Correlations Between Anxious and Avoidant Attachment, and Dependent Variables, Controlling for Objective Time Condition</i>	80
Table 14.	<i>Study 2: Path Coefficients for Avoidant Attachment Mediation Estimated Using PROCESS (Model 4)</i>	83
Table 15.	<i>Study 2: Path Coefficients for Anxious Attachment Mediation Estimated Using PROCESS (Model 4)</i>	84
Table 16.	<i>Study 3: Means, Standard Deviations, and Zero-Order Correlations with Subjective Distance</i>	86
Table 17.	<i>Study 3: Results of ANCOVAs (Controlling for Distress)</i>	87
Table 18.	<i>Study 3: Results of ANOVAs (Not Controlling for Distress)</i>	88
Table 19.	<i>Study 3: Regression Analysis of Objective and Subjective Time on Reactions to Past Failure – Objectively Recent, Feels Recent</i>	89
Table 20.	<i>Study 3: Regression Analysis of Objective and Subjective Time on Reactions to Past Failure – Objectively Recent, Feels Distant</i>	90
Table 21.	<i>Study 3: Regression Analysis of Objective and Subjective Time on Reactions to Past Failure – Objectively Distant, Feels Recent</i>	91
Table 22.	<i>Study 3: Regression Analysis of Objective and Subjective Time on Reactions to Past Failure – Objectively Distant, Feels Distant</i>	92

List of Figures

- Figure 1. Study 2 regression of avoidant attachment style X objective time condition interaction on subjective time perceptions.81
- Figure 2. Study 2 regression of anxious attachment style X objective time condition interaction on subjective time perceptions.82
- Figure 3. Sample diagram for Study 2 mediation model, using avoidant attachment as independent variable, and present affect as outcome variable85

List of Appendices

Appendix A: Study 1A & 1B Materials	93
Premeasures	93
Attachment Style	94
Study Qualifier Questions	95
Relationship Questions (if currently in a relationship).....	95
Study Instructions/Measures: Study 1A	96
Study Instructions/Measures: Study 1B.....	100
Post-Measures (Study 1a and 1b).....	103
Appendix B: Study 2 Materials	105
Premeasures	105
Relationship Attachment Styles and Satisfaction.....	108
Study Instructions	109
Dependent Variables.....	110
Post Measures.....	115
Appendix C: Study 3 Materials	119
Pre-Measures.....	119
Study Instructions and Materials.....	119
Dependent Variables.....	122
Demographics	123

It is often said that time heals all wounds. Intuitively, this can be true – people may feel better about a bad or traumatic event as time goes on, and most people can think of cases where the intensity of their negative affect did indeed subside with time. However, many people can also think of instances in which bad feelings persist long after an original incident. Indeed, this phenomenon is reflected in clinical cases of post-traumatic stress disorder, in which traumatic events are characteristically experienced as extremely recent – as though the event is being relived over and over - despite the passage of time (e.g. Ljungman, Hoven, Ljungman, Cernvall, & von Essen, 2015). Even short of clinical-level trauma, people vary in the degree to which they “get over” negative events, and evidence suggests that there are even more ordinary negative events from which life satisfaction never fully rebounds (e.g. Lucas, 2005). Why might this be? Why do some events persist while others don’t? Why do these events persist for some people, but not others? And with such variability, is it really accurate to say time heals all wounds?

Defining Time and Healing

To consider this question clearly, we must first define what we mean when we speak about the concept of time. More specifically, we identify and consider two different forms of time. The first will be referred to as *objective* time: that is, the chronological passage of time, defined as the actual number of actual days, months, or years that have passed. The second will be referred to as *subjective* time (also referred to as *subjective distance* or *subjective temporal distance*). This is the psychological feeling of time: whether temporally-removed events, both past and future, feel psychologically proximal or remote. Although these representations of time may be connected, they are also meaningfully distinct, and they may underlie emotional and cognitive responses to past events in distinguishably different ways.

A second definitional question is what, precisely, is meant by healing a wound? Although the concept of *healing* can have a variety of complex meanings, particularly in the clinical domain, we are defining it more simply here – the degree to which intense negative affect subsides over time following an unpleasant or distressing experience (or metaphorically, the *wound*).

Although the “healing” question focuses on negative events, we can also ask a related, broader question: whether all affect intensity, both positive and negative, subsides over (objective and subjective) time. Indeed, research has found that the emotional intensity of positive events does also fade over time, albeit at a slower rate compared to negative events (see Skowronski, Walker, Henderson, & Bond, 2014). However, the contexts of the greatest interest are often negative events – although it may be desirable to sustain positive affect over time, research often prioritizes a focus on how to decrease negative affect and its downstream consequences.

Does Objective Time Heal All Wounds?

Normally, when individuals claim that time can heal, they are at least implicitly referring to objective, calendar time. What is the evidence that objective time plays such a role? Research has shown that objective time is indeed linked to how people experience emotion about a past (or future) event. Emotional arousal tends to increase when emotionally charged events are nearer in time, versus events that are objectively farther (e.g. Van Boven, Loewenstein, Welch, & Dunning, 2012; Walker, Vogl, & Thompson, 1997). For past events, the passage of time predicts both attenuated affective intensity and reduced personal importance (Ritchie et al., 2006). This decline in intensity is particularly true for negative events, relative to positive events, a phenomenon dubbed the fading affect bias (Skowronski et al., 2014).

Furthermore, objective time shapes how individuals subsequently respond to emotional events in an interpersonal context. Research on forgiveness after an interpersonal transgression has shown that as more time passes, the motivation to avoid or seek vengeance on the transgressor decreases (McCullough, Fincham, & Tsang, 2003). When recovering from a traumatic life event, such as divorce or the death of a child, many individuals do tend to approach their prior levels of life satisfaction, given enough time (Ljungman et al., 2015; Lucas, 2005). However, objective time heals wounds only imperfectly and on average: although people tend to adapt to both positive and negative significant life events, there are substantial individual differences in the extent of adaptation, and for some individuals, a major life event continues to have an effect on well-being over a decade after the event occurred (e.g. Lucas, Clark, Georgellis, & Diener, 2003; Lucas, 2007). Taken together, these studies suggest that overall, the passage of time is at least somewhat associated with the “healing” of emotional wounds – people on average do report less intensive negative reactions to unpleasant events that occurred further back in time – but the passage of time alone cannot be considered the main determinant of healing.

Does Subjective Time Heal All Wounds?

Although “time heals all wounds” arguably refers to the passage of chronological time, it is possible to ask parallel questions about people’s sense of subjective time or distance from an event. Perceptions of greater subjective distance can attenuate negative affect resulting from an event. Individuals who are prompted to feel subjectively farther from a past failure see their current selves more favourably than those who feel close (Ross & Wilson, 2003; Wilson & Ross, 2003). In related work by Kross, Ayduk, and Michel (2005), participants were induced to take either a self-immersed or a self-distanced approach to recalling a time when they felt

overwhelming anger. Participants who were in the self-distancing condition felt less anger in the present than those who were self-immersed. Although self-distancing versus immersion reflects different ways to mentally process an event, thus shifting more than just subjective time, we speculate that those who regard a memory from a self-distanced perspective likely also see it as further away in time. Further work by Ayduk and Kross (2010) found that emotionally self-distancing (versus remaining immersed) from hurtful memories reduced feelings of upset.

Individuals induced to feel farther from, rather than closer to, a negative incident also demonstrate more adaptive interpersonal outcomes. Cortes, Leith, and Wilson (2018) found that participants who were induced to feel subjectively far from (rather than close to) a negative relationship memory reported higher levels of relationship satisfaction. A parallel effect is also found with positive incidents – individuals who feel subjectively closer to past kindnesses in their friendships report greater relationship satisfaction (Wakimoto, 2011). Furthermore, research has shown that individuals who are made to feel greater subjective distance from a transgression against themselves (Wohl & McGrath, 2007) or a third party (Cheung & Olson, 2013) were more likely to forgive the transgressor.

Additionally, because perceptions of subjective time are malleable, they can also be shifted by the emotional valence of experiences. Numerous studies have shown that individuals tend to report greater subjective distance from negative events, versus positive ones, even when objective distance is held constant (e.g. Ross & Wilson, 2002; Peetz, Wilson, & Strahan, 2009). The same pattern is found when considering ambiguous events that can be construed in either a positive or negative manner; individuals who perceived a historical event as negative judged it as subjectively farther than those who judged the same event in a more positive light (Gunn & Wilson, 2007, as cited in Wilson, Gunn, & Ross, 2009).

Subjective time is not solely predicted by the valence of an experience, but also by its intensity. In a series of studies, researchers explored how inducing greater or lesser intensity of emotion would impact perceptions of psychological distance (Van Boven, Kane, McGraw, and Dale, 2010). They found that describing events emotionally (i.e. “in an empathic manner”) rather than neutrally (i.e. “in a detached and unemotional manner”) increased subjective closeness to the event; this pattern was found for both past and future events, positive and negative events, and personal and news events. In a follow-up study, participants assigned to a more emotionally arousing social role (as a performer) felt closer to a future performance than those assigned to a less arousing role (as an observer), with negative emotional intensity mediating the relationship between assigned role and subjective distance.

One psychological construct that is closely connected to the construct of psychological distance is construal level theory (see Trope & Liberman, 2010). Construal level theory posits that when considering events that are (either objectively or subjectively) close, these events are construed more concretely, with a greater focus on details, whereas events that are distant are instead construed more abstractly, with a greater focus on the bigger picture. For example, a student who thinks about writing a dissertation at the beginning of a graduate program may focus on the abstract features, like the culmination of years of learning, while a student at the end of the program may focus on concrete details like formatting tables and reference sections.

Though construal level often covaries naturally with psychological distance, some research has shown that the two do not always coincide, and indeed abstraction and distance can have opposing predictions, particularly in affective contexts. Williams, Stein, and Galguera (2013) found that abstract (versus concrete) construal generally improves the affective evaluations of all experiences, both positive and negative, as an abstract mindset may increase

the salience of the *reason* for, or goals that underlie, that behaviour (e.g. suffering pain at the dentist may be seen more positively when placed in the abstract context of improving one's dental health; an emotionally negative event could be construed as a learning experience.) The same is not true, however, of psychological distance. While greater psychological distance (versus closeness) did reduce negativity towards negative experiences, it also reduced positivity towards positive experiences. Thus, it appears that while construal level affects the valence of events (with a more abstract construal leading to greater positivity overall), psychological distance instead affects emotional intensity (with greater psychological distance leading to reduced emotional intensity regardless of valence). In light of this research, and given that our interest falls specifically in the domain of affect and distance, we have chosen to focus solely on subjective distance, rather than examining any potential influences of construal level.

The Mechanisms Behind Experiences of Time

Why might the passage of time attenuate negative emotion? Researchers have posed similar explanations for the links between emotional experience and both objective and subjective time. Two factors most relevant to the current analysis are attention and fluency.

Attention. First, people pay greater attention to events that are nearer in time than those that are farther. Recent events are likely to be more salient in memory, better recalled, and more often rehearsed (e.g. Brown, Neath, & Chater, 2007; Ritchie et al., 2006). When individuals were asked to recall the order in which a pair of events occurred, they were more accurate, and took less time to answer, when one of the pair had happened more recently than when both events were from the more distant past (Skowronski, Walker, & Betz, 2003). People also pay more attention to events that feel subjectively closer. People will recall and rehearse events, both

positive and negative, more frequently when they feel close, rather than far (Ross & Wilson, 2002; Cortes & Wilson, 2016).

Sustained attention to an event (for example, event rehearsal) tends to be linked to continued emotional intensity (Ross & Wilson, 2003). Walker and colleagues (2009) found that more frequent mental rehearsal of autobiographical events was related to affect being sustained for longer periods of time (however, notably, increased *social* rehearsal – or talking about the event with others - was associated with more rapid affective fading for negative events.) Lindeman, Zengel, and Skowronski (2016) found that events that were recalled more vividly, and were more frequently rehearsed, were more affectively powerful. Thus, both objective and subjective closeness may be bidirectionally linked to attention and rehearsal – closer things get more attention, but greater attention and rehearsal may also make things feel closer. Likewise, greater attention and rehearsal increase emotional intensity, but it is also likely that more emotionally intense events attract more attention and are rehearsed more often.

Fluency. Fluency in this context is defined as the ease of thinking about, or bringing to mind, events – both recalling past events, and imagining future events. Research has found that individuals find it easier to think about objectively closer (versus farther) events, and that these closer events contain richer sensory details (D'Argembeau & Van der Linden, 2004; Johnson, Foley, Suengas, & Raye, 1988). Similarly, fluency tends to be related to *subjectively* closer events. Ross and Wilson (2002) found that events that felt closer were easier to recall than those that felt distant, while other research has found that events manipulated to be less fluent (i.e. written in a less legible font, recounted with audio with more white noise included) felt psychologically farther than those that were more fluent (Alter & Oppenheimer, 2008; Mrkva, Travers, & Van Boven, 2018). Fluency is also tied to the subjective recall of objective dates. Participants who

were asked to recall two pieces of information (the high fluency condition- because it feels easy to recall 2 items of information) rather than ten (the low fluency condition- because it feels difficult to recall 10 items of information) about the Oklahoma City bombing believed it had happened more recently in time (Xu & Schwarz, 2005, as cited in Schwarz & Clore, 2007).

Like attention, fluency is also tied to emotion. A large body of research has examined fluency in the context of neutral stimuli, and has found that greater perceptual fluency is tied to greater positive affect (e.g. Reber, Winkielman, and Schwarz, 1998; Winkielman & Cacioppo, 2001; see Alter & Oppenheimer, 2009). However, stimuli that are more fluent are also perceived as more truthful (e.g. Reber & Schwarz, 1999; Kelley & Lindsay, 1993), and are related to more confidence (e.g. Novemsky, Dhar, Schwarz, & Simonson, 2007; Simmons & Nelson, 2006). Furthermore, research by Albrecht and Carbon (2014) demonstrated that processing fluency amplifies emotional evaluations of non-neutral stimuli (in this case, pre-rated photographs): participants in a high fluency condition perceived positively valenced photographs as more positive than those in a non-fluent condition, but also perceive negatively valenced photographs as more negative. Thus, although neutral stimuli may be viewed more favorably when fluent, high fluency also appears to amplify pre-existing valence (fluent positives are more positive, negatives more negative).

Objective and Subjective Time: How Are They Related?

How closely are objective and subjective distance related to one another? If subjective time was simply a psychological representation of objective time, we would expect very high correlations between these measures. As it turns out, while the two constructs tend to be interrelated (with subjective time increasing as objective time does), the relation is often not very strong. Many studies have found a significant but weak relation between objective and subjective

time (e.g. Ross & Wilson, 2002, Study 1 and 2; Cortes et al., 2018; Gebauer, Haddock, Broemer, & Von Hecker, 2013; Cheung & Olson, 2013; Wakimoto, 2011, Study 2). Some studies have found a stronger relation between the two (e.g. D'Argembeau & Van der Linden, 2004), while others have found no correspondence between the two (e.g. Ross & Wilson, 2002, Study 3; Wakimoto, 2011, Study 1 and 3).

Why does the link between objective and subjective time vary so much? Van Boven and Caruso (2015) proposed a model of temporal psychological distance, which in part explored how, why, and when objective and subjective time might diverge. People learn to associate phenomenological features, such as attention/salience and fluency, with the passage of time, and may come to make time estimates on the basis of these cues. Because both objective and subjective time are typically associated with these phenomenological features, in many situations the cues correctly inform estimates of objective time, and also affect subjective time (in such cases, the 2 types of time estimate will be related). However, these phenomenological features are able to vary independently of time – certain events may garner more or less attention or feel more fluent, regardless of their distance. For instance, someone might recall the long-past death of a loved one as salient, fluently recalled, and frequently rehearsed. This may cause the death to feel subjectively closer, yet it is unlikely to alter their estimate of objective time. In these situations, changes in phenomenological features may prompt changes in malleable, subjective time perceptions, while objective time remains constant. This may explain the great degree of variance in how strongly these two forms of time correlate.

More generally, researchers have acknowledged that objective and subjective distance are two related but separate constructs. In many studies examined, researchers will focus on one construct, while neglecting the other (e.g. Wakimoto, 2011), or not allowing it to vary (e.g.,

Peetz, Wilson, & Strahan, 2009; Wohl & McGrath, 2007). In other studies, primarily those focused on the subjective experience of time, researchers will measure both constructs, and control for the one of less interest (usually objective time) when testing the effect of the variable of most interest (usually subjective time) (e.g., Ross & Wilson, 2002; Cheung & Olson, 2013; Cortes et al., 2018). However, in past studies focused primarily on subjective time, objective time has not been manipulated; further, measured dates may be inaccurate due to participant error or bias. In studies focused primarily on objective time, subjective time is rarely measured at all. However, we have found no research to this point explicitly examining in a systematic way how objective and subjective time operate *simultaneously*; that is, what are the relative contributions of each construct in predicting how an event memory changes over time? This is of particular interest given that both measures of time are (somewhat) linked to “healed wounds” or attenuated affective reactions, and due to the relatively weak (and sometimes absent) correspondence between subjective and objective time more generally.

Overview of the Present Research

The goal of the present research is to examine the respective roles of objective and subjective time, in order to determine how time “heals all wounds.” We identified three main possibilities or “competing hypotheses” when considering this goal. First, it could be that the objective passing of time, and not the subjective feeling of time, is most responsible for the healing process. This would indicate that when individuals are healing from past harms, there is nothing that the individual can do except wait for enough time to pass. However, we consider this pattern (which suggests little effect of subjective time) unlikely. As noted previously, some past research has found that experimentally altering one’s sense of subjective time, holding constant the objective distance from an event, can result in changes in some emotional thoughts

and outcomes (e.g., Ross & Wilson, 2002; Cortes et al., 2018; Wohl & McGrath, 2007; Cheung & Olson, 2013). Second, it could be that both objective and subjective time are largely measuring the same thing, and will be equally important to healing past hurts. Once again, only the passage of time could heal wounds, but this healing process would also be accurately tracked by one's sense of subjective time. This hypothesis is plausible, but its likelihood is reduced by the large body of literature demonstrating that the two forms of time judgment show a relatively low level of correspondence (suggesting they are not always measuring the same thing). Finally, it could be that subjective time matters above and beyond objective time when individuals consider their emotional reactions to past events. This would indicate that the passage of chronological time is not necessary to heal wounds but that the feeling of distance is needed; conversely, this also would mean that a wound could persist regardless of the amount of time passing. This hypothesis is our favoured perspective; although past research has not set out to systematically test objective and subjective time against one another, in cases where both are measured, subjective time powerfully predicts affective outcomes after objective time is controlled (e.g., Ross & Wilson, 2002; Cortes et al., 2018).

Although prior research has addressed some of these questions, we intend to contribute to the literature in some specific ways. We will examine both subjective and objective time in a more systematic way than has been previously been accomplished: rather than looking at only objective time, or only subjective time while holding objective time constant, we will be examining the relative contributions of both, simultaneously. This will give researchers a clearer understanding of how both forms of time contribute to understanding the past and its impact on emotion.

In Study 1, we examine the basic relationship between objective time, subjective time, and emotional events, both negative (Study 1A) and positive (Study 1B). Unlike prior research, we manipulate objective time by randomly assigning participants to think of events that fall either more recently or more remotely on their own objective timeline, ensuring a greater amount of separation between close and distant objective dates. Furthermore, having distinct dates allows us to more carefully anchor objective time, and thus test the incremental contributions of subjective time with more precision.

In Study 2, we also examine factors that precede the formation of perceptions of subjective time. Although we have identified some mechanisms – attention and fluency – that may relate to the perception of subjective time, and that distinguish it from the objective time that has passed, there is still a question as to *why* these mechanisms differ between individuals. We intend to examine whether individual differences may underlie some of these perceptions of subjective time. Although we believe there may be a variety of individual differences that could affect these perceptions, depending on the context of the situation, in Study 2 we ask people to consider negative relational events, and accordingly we specifically investigate a chronic individual difference likely to affect memories of past transgressions within the context of close relationships: attachment security or insecurity. Drawing from past research (Cortes & Wilson, 2016), we believe those who are more securely attached within their relationships are less likely to see negative events as definitional of the relationship, thus paying less attention to these past events (e.g. thinking about them less frequently), and perceiving them as subjectively farther, compared to those who are less securely attached.

Finally, this is the first program of research to manipulate both objective and subjective time in the same study (Study 3). Past research has successfully manipulated either objective or

subjective time, while measuring the other, but to date we are unaware of any research that has manipulated both forms of time simultaneously. Thus, this is the truest test of the *causal* role of both objective and subjective time in affecting emotional reactions to past events.

Study 1a

The goal of Study 1a was to examine the basic relationship between objective time, subjective time, and emotion-related outcome variables (our indicators of responses akin to “healing”), in the context of negative past events. For this initial study, we chose to focus on participants’ breakup history. This event type was chosen for several reasons. First, this is a specific event type that is at least somewhat comparable across individuals (versus other more idiosyncratic negative events such as ‘a time when you were hurt’). Second, it is an event that often provokes strong emotion reactions (e.g. Davis, Shaver, & Vernon, 2003; Sprecher, Felmlee, Metts, Fehr, & Vanni, 1998). Third, we sought an event type for which it would be possible to randomly assign people to an objectively more recent vs distant condition. Although we could not assign individuals to recall a breakup from a specified time period, we could ensure that all eligible participants had reported experiencing at least two distinct breakup events. As a result, participants could be randomly assigned to recall an event that is either temporally closer or farther within their own personal romantic history (i.e., assigned to recall their *first* breakup or their *most recent* breakup). Any participants who did not fulfill these eligibility criteria (e.g., they reported having experienced one or zero breakups) were instead routed into Study 1b, where they were prompted to recall a different event type.

Across studies, we assess affective responses to the target event or memory. We ask people how they felt about the event at the time of the event, how they feel about it now, and how they expect to feel about it in the future. The dependent measure of central interest is

current affect. If either objective or subjective time “heals wounds,” then affect in the present should be related to one or both kinds of time. Expected affect in the future is an additional, secondary dependent measure. Here we ask whether people who feel more intense emotion in the present expect this feeling to persist into the future; we expect that this variable will largely reflect how individuals feel at present. With respect to retrospective judgements of affect *at the time* of the event, we have no reason to expect (for theoretical reasons) that past affect will be related to the time of event occurrence (distance should act on the change in emotion over time, not original affect levels). However, we also recognize a couple of processes that might account for differences in affect at the time of event. First, it is possible that when people retrieve a more distant event, natural memory decay has caused many memories to fade, so they may only bring to mind especially vivid distant past events. In other words, people may systematically choose a memorable distant event (because these events stand out in memory) whereas a wider range of mundane recent event may still be available in memory to select from. If this selection bias occurs, selection effects could lead past affect to seem more intense for objectively distant events. Second, we also acknowledge that retrospection is often coloured by present affect: specifically people might recall an intense present emotion as also being more intense at the time. Thus, because of competing potential predictions, we don’t make specific predictions for how past affect will be related to time judgments, but we think a variety of effects are plausible.

We hypothesized that participants who were asked to recall their most *recent* breakup, versus their *first* (most *distant*) breakup, would report greater negative affect at present, and continuing into the future. That is, we expected that objective time would have some impact on emotional healing. However, we predicted that participants’ reports of subjective distance would predict negative affect, above and beyond objective time, such that breakups that felt

subjectively *closer* would be associated with more negative affect than those that felt subjectively *farther*, regardless of their distance in objective time.

We also asked participants to report on a number of evaluative and phenomenological features of their breakup memory (e.g., how important it was, memory perspective, rehearsal, fluency), in an attempt to measure some of the mechanisms that tend to underlie the effects of both objective and subjective time. These measures are included as a secondary interest and are somewhat exploratory, but we can derive basic predictions about how they will be related to both subjective and objective time. Much like our measures of affect, we expect that these memory variables will be related to both objective and subjective time, given the link between these phenomenological variables with both forms of time in prior literature (e.g. Ritchie et al., 2006; Ross & Wilson, 2002; D'Argembeau & Van der Linden, 2004; Mrkva, Travers, & Van Boven, 2018). However, we expect that they will be predicted by subjective time over and above objective time, given that these variables can and do vary separately from objective time in other research, particularly in cases where objective and subjective time show a greater divergence from one another.

Method

Participants

Three hundred and eighty-two undergraduates from a Canadian university were recruited to participate in an online study for course credit. One hundred and forty-five of those participants reported having experienced at least two breakups of romantic relationships, and were thus eligible to participate in this study. The remaining participants were directed to study 1b. Seventeen participants were excluded from analyses for failing at least two of three attention

checks (see Meade & Craig, 2012), leaving one hundred and twenty-eight remaining participants ($M_{\text{age}} = 19.6$, $SD = 3.1$; 103 female, 23 male, 2 undisclosed; 91.3% White¹).

Procedure²

Relationship questions. First, all participants indicated whether they were in a romantic relationship at present, and the number of romantic relationships they had been in during their life. Participants had to have been in at least two breakups in their romantic history to participate, in order to ensure that all participants had both a first breakup and a most recent breakup, and that those two breakups were not the same event. The two hundred and thirty-seven participants that did not have two breakups in their romantic history were routed into Study 1b, which will be discussed at length later. Eligible participants had a mean of 4.6 romantic relationships.

The participants who indicated that they were in a relationship at present (54 participants, which accounted for 42.2 % of all participants) were asked to indicate the length of their current relationship, their current partner's gender (92.5% of respondents who were in a relationship were presently in a heterosexual relationship), and their satisfaction with their present relationship: "how satisfied are you with this relationship", "how content are you with this relationship", "how happy are you with this relationship", and "how close are you with your partner?" (Cronbach's $\alpha = .91$). Preliminary analyses indicated that none of these variables interacted with our variables of interest, though some were correlated with dependent variables. Reported results do not change in pattern or significance if controlling for present relationship

¹ Though we had no predictions for gender or age in this or any other study, we did consider these variables as covariates. Preliminary analyses indicated that gender and age did not interact with variables of interest, though occasionally a difference emerged on specific dependent variables. Reported results do not change in pattern or significance if controlling for either or both covariates; therefore, we report the results without any covariates included.

² Some additional measures were included in this and other studies (e.g. implicit theories, self-esteem, locus of control, dialectical thought, and general attachment style); they were not relevant to our hypotheses, and are not examined any further.

status, number of prior relationships, current partner's gender, or current relationship satisfaction.

Distance from breakup. Participants were randomly assigned to recall either their most recent breakup (in the *recent* condition), or their first breakup (in the *distant* condition). They were asked to describe the breakup, provide its date, and provide the length of the relationship in question.

Participants were then asked to indicate their perceived subjective distance from the breakup: "Sometimes events tend to feel closer or further away, regardless of how long ago it actually occurred. Think about the event that you described for this study. Place the slider at the point that best indicates how long ago that event feels to you." Participants indicated their responses on two slider bars, ranging from 1 to 100, with the end points "feels very close" and "feels very far away" on one bar, and "feels like yesterday" and "feels very distant" on the other. These two items were averaged to create an index of perceived subjective distance, with higher scores indicating greater subjective distance (Cronbach's $\alpha = .95$).

Breakup questions. Our primary dependent measures focus on people's *current* evaluation and emotional reaction to the past breakup. We also asked identical questions about their remembered response *at the time* of the breakup and how they expected to feel one year in the *future*. Participants reported their past, present, and anticipated future negative affect surrounding the breakup (four items: *how upset/angry/hurt/happy were you about this breakup*, on a seven-point scale, with the endpoints *not at all* and *extremely* (happy was reverse coded); Cronbach's $\alpha = .91$ for past, $.76$ for present, and $.58$ for future³), and then rated the importance of

³ Cronbach's α for present and future affect was improved by removing the reverse coded happiness item (Cronbach's $\alpha = .88$ and $.87$ respectively; Cronbach's α for past decreased slightly to $.90$). This did not impact the significance or pattern of results, however, so all items are included in upcoming analyses.

the breakup at its occurrence, at the present moment, and one year in the future (on a seven-point scale, with the endpoints *not at all* and *extremely*). Additionally they indicated how this breakup compared to others that they had experienced, on a seven-point semantic differential scale in terms of ease (endpoints *easier* and *harder*), emotionality (endpoints *more emotional* and *less emotional*), memorability (endpoints *more memorable* and *less memorable*), and negativity (endpoints *more positive* and *more negative*; Cronbach's $\alpha = .87$; higher scores indicate a more negative breakup compared to others)⁴, and how negatively they thought about their prior relationship partner (four items on a seven-point semantic differential scale; endpoints were *moral* and *immoral*, *good* and *bad*, *trustworthy* and *untrustworthy*, and *likeable* and *unlikeable*; Cronbach's $\alpha = .89$; higher scores indicate more negative perceptions).

Finally, participants were asked several items about memory perspective and immersion taken from Ayduk and Kross (2010) (e.g. *to what extent did you feel like an immersed participant versus a distanced observer when recalling the breakup?*, on a seven-point scale, with endpoints *predominantly like an immersed participant* and *predominantly like a distanced observer*), as well as several others about their experiences thinking about this breakup prior to and during the study (two items on a seven-point scale: *how often do you think about this breakup?*, with endpoints *not often at all* and *extremely often*; and *how easy or difficult was it for you to recall the factual details of this breakup?*, with endpoints *very difficult* and *very easy*) , before completing a demographics section that included age, gender, and ethnicity.

Results and Discussion

Manipulation Check

⁴ Patterns are identical if event memorability is excluded from this composite

We examined whether our objective distance manipulation (having participants think about their first or most recent breakup) did lead participants to think of different objective periods of time. Due to the heterogeneous variances in the two conditions, we used Welch's t -test for unequal variances. As expected, among those participants who reported a breakup date, those who thought about their first breakup thought about a point in time that was, on average, more distant ($M_{\text{days ago}} = 1290.62$, $SD = 1353.07$) than participants who thought about their most recent breakup ($M_{\text{days ago}} = 510.33$, $SD = 457.92$, $t(65.10) = -4.25$, $p < .001$, 95% CI of the difference = [-1163.01, -397.58]).

Preliminary Analyses

We then examined how closely our measure of subjective time was tied to our objective time condition. We found that subjective time was not significantly predicted by whether participants were in the first ($M_{\text{subjective time}} = 68.55$) or more recent breakup condition ($M_{\text{subjective time}} = 64.34$; $t(124) = -.784$, $p = .43$, 95% CI = [-14.84, 6.41]). Although subjective time wasn't affected by breakup condition, there was considerable variation in how distant the actual breakups were, from two months previous to over ten years. Subjective time was predicted by the number of days reported since the breakup (calendar time), $\beta = .19$, $t(114) = 2.11$, $p = .037$, 95% CI = [.0003, .01]. Although there is a correlation between calendar and subjective time, the effect size is small suggesting that there are other sources of variance that may account for people's ratings of subjective time.

Role of Objective and Subjective Time in Responses to Past Breakups

We predicted that although participants may differ in their reactions to a recalled breakup based on whether they thought about their most recent (closer in calendar time) or first breakup (farther in calendar time), that the subjective, psychological time from that breakup would

predict reactions above and beyond calendar time. Our analysis strategy was to conduct an objective time condition X subjective time multiple regression analysis. In this study, as well as all others, we entered our predictors as follows. The effect coded (-1 = most recent; and +1 = most distant) objective time condition was entered at Step 1 to allow us to assess the effect of chronological position alone, as chronology cannot be influenced by subjective perceptions of time. In Step 2, we entered the mean-centered measure of subjective time, in addition to objective time condition, because we wished to see the effect that subjective time had over and above objective time – that is, how do the parts of subjective time that are unconnected to objective time work to predict our outcomes?⁵ Finally, in Step 3, we entered the interaction term: objective time X subjective time, though we did not have any predictions for this interaction.

First, we examined the effect of objective time on responses to breakups. As shown in Table 2, few main effects emerged for whether people thought of their first or most recent breakup. Participants did find their most recent breakup to be more important in the present, and thought about this breakup marginally more often. Next, we examined the role of subjective time in step 2 (representing its effect over and above objective time)⁶. As expected, subjective time emerged as a significant predictor on most of the DVs. Participants who felt subjectively closer to a breakup report that it is, and will continue to be, more important and more emotionally

⁵ We also examined the effects of subjective time without controlling for objective time (see Table 1 for descriptives and zero-order correlations); we find the same pattern of results. However, we contend that examining subjective time while controlling for objective time is a truer test of our hypothesis, as it removes the contribution of the objective differences in dates from the other subjective phenomena.

⁶ Although we could also assess the results of objective time at Step 2, we chose not to report these results for two reasons. First, the meaning of objective time when subjective time is being controlled is unclear, since subjective perceptions of time are created, in part, by the passage of objective time. Second, nothing noteworthy occurs at Step 2 that alters interpretation of Step 1: we consistently find that the results for objective time in Step 2 are similar to those found in Step 1, but somewhat attenuated.

negative⁷, regardless of when the breakup occurred in objective time. Participants also recalled these breakups more easily and vividly, and had thought about them more often. There was no main effect of subjective time on importance at the time of the breakup, current perceptions of ex-partners, and whether a first- or third-person perspective was taken.

We did find two significant objective time X subjective time interactions; one for participant judgments of their former partners ($\beta = -.22$, $p = .017$, 95% CI = [-.02, -.002], R^2 change = .05), and one for the negativity of this breakup compared to other breakups ($\beta = -.17$, $p = .039$, 95% CI = [-.02, -.001], R^2 change = .03). For both variables, the pattern revealed that the effect of subjective time was consistent with our main effect, but that it was stronger (or in the case of person judgment, only present) when participants were recalling their first breakup.

Secondary Analyses of Objective and Subjective Time

Although we use the term “objective time” we recognize that subjective phenomena can affect how people estimate dates, so “objective” date estimates may not always be accurate and may themselves be coloured by subjective phenomena (see Brown, Rips, & Shevell, 1985). Although we cannot be completely certain that date estimates are accurate, we focus analyses primarily on objective time conditions with the expectation that participants would recall memories that reliably fell into either a more recent or distant timeframe, even if exact date estimates were not precise. One of the downsides of focusing on just two objective time conditions, however, is that we treat subjective time as a continuous variable allowing considerable individual difference variability, whereas we treat objective time as two broad categories, eliminating much of the potential variability that would arise by evaluating objective

⁷ We examined whether past affect might influence our results, given its significant relationship with subjective time, and ran additional analyses using past affect as a covariate. Our pattern of results remained the same for all other dependent variables when past affect was entered as a covariate.

time as a continuous variable itself. However, because we do have reported dates from participants, and considerable variability exists *within* each objective time condition, we conducted a secondary analysis of the relationship between objective and subjective time, using the number of days since the breakup as a continuous measure of objective time. We did separate analyses within each condition because objective time conditions sampled from different periods (i.e., combining both conditions would produce a bimodal distribution).

First, we examined the correlations between the reported number of days since the breakup, and participant perceptions of subjective distance from the breakup. We found that the two measures were positively related for participants recalling their first breakup, $r(54) = .37, p = .005$, but were not for participants recalling their most recent breakup, $r(61) = .18, p = .172$.⁸

We then conducted regression analyses that parallel our primary analyses, with two important changes: separate analyses were conducted within each objective time condition (first and most recent breakup), rather than across both; and the objective time predictor variable was the number of days since the remembered breakup, rather than objective time condition. Thus, we conducted a series of objective time X subjective time multiple regression analyses, examining the effect of objective time by itself in Step 1, subjective time controlling for objective time in Step 2, and the interaction between the two in Step 3, using the reported number of days since the breakup as our objective time measure, and participant reports of subjective time as our subjective time measure. We expected the results to parallel those found before, with the measure of subjective time predicting our dependent variables over and above the number of days since the breakup. We had no specific predictions for any interaction terms.

⁸ In this and in future analyses, our combined N (115) is lower than our study N (128), due to participants who did not give a specific date (in this study, a breakup date), but otherwise responded to all measures.

In both the first breakup condition (see Table 3) and the most recent breakup condition (see Table 4), we see results that are strikingly similar to our initial analyses. Once again, the objective differences in time since a breakup are generally weakly related, if at all, to how participants respond to our dependent variables, but the subjective perceptions of time are generally strongly related, particularly when participants are considering their own emotions at present.⁹

Thus, Study 1a found that while objective time had little influence over how people thought about their past breakups, it was perceptions of subjective time that were strongly related to perceptions of the event, over and above any effects of objective time. This was true whether objective time was measured as a categorical variable (first versus most recent breakup), or a continuous variable (number of days since the breakup). In addition to greater emotional intensity persisting for events that are subjectively near, the phenomenological variables relating to attention and fluency are also more tied to subjective time, rather than objective.

One aspect of this study that is worth noting is that we are not sampling an entirely representative population of undergraduates. Over half of our prospective student participants were not eligible for this study, as they had not experienced at least two breakups. Because of this, our sample will not be representative of young adults with less extensive dating experience, which could conceivably be related to differences in personality or attitudes. It is conceivable that the pattern of subjective time perceptions we observe will be particular to the sample we recruited and not entirely generalizable. However, we have no specific reason to believe that

⁹ We do find three objective time X subjective time interactions between our two sets of analyses; due to the fact that these were unpredicted, as well as the low number of participants, we will not fully interpret these interactions. Generally, the trend was that subjective distance showed a stronger effect when the breakup was objectively longer ago.

subjective time perceptions would differ between our study population and those who were ineligible.

Study 1b

Rather than exclude all ineligible participants from Study 1a, we took the opportunity to funnel ineligible participants to a second study option, reporting on a memory type that everyone can be reasonably expected to have. In Study 1b we examine the effect of objective and subjective time by asking participants to report on their most recent or more distant (3 years ago) birthdays. Birthdays were chosen as the remembered event for several reasons. Unlike our other studies, birthdays are generally *positively* valenced¹⁰, and would allow us to test whether our hypotheses about affect fading over (objective and subjective) time are confined to negatively valenced events only or (as predicted) generally applicable to other memory types as well. Note, however, that these studies are not designed to compare positive and negative events or evaluate the relative strength of the effects across event valence.

Furthermore, birthdays are an event where we can be nearly certain that the objective date reported by participants is accurate. While we are asserting that we are examining our calendar time conditions as ‘objective’ time, we acknowledge that these participant recollections are not perfectly accurate. As previously noted, we know that subjective phenomena, like the accessibility of a memory, can affect how people estimate dates (Brown et al., 1985). In most cases, we are relying on the fact that our objective time conditions are far enough apart that events in each condition will be distinct. In this study, however, we assume that the majority of participants are able to accurately recall the date of their birthday.

¹⁰ Although we acknowledge that birthdays are not invariably positively valenced – particularly as individuals get older – we predicted that with our young sample, most birthdays would contain experiences that would be relatively happy. Indeed, when asked about their happiness on their birthday, we find that of our participants, 87.3% reported happiness at or above the scale midpoint.

Once again, we predicted that birthdays that are objectively more recent may be related to more intense, and in this case positively-valenced, emotion. Furthermore, *subjective* closeness (rather than distance) will predict positive emotions about birthdays beyond what is predicted by objective time.

Method

Participants

Two hundred and thirty-seven undergraduates who were not eligible to participate in study 1a (because they had not experienced at least two breakups) were eligible to participate in this study. Twenty-two participants were excluded from analyses for failing at least two of three attention checks. A further seventeen participants were excluded for reporting a memory that did not fall within the given date parameters, leaving one hundred and ninety-eight remaining participants ($M_{\text{age}} = 19.0$, $SD = 1.4$; 166 female, 32 male; 75.3% White).

Procedure

The initial study procedure was identical to Study 1a. Participants indicated whether they were in a romantic relationship at present, and the number of romantic relationships they had been in during their life; participants who had not experienced at least two breakups were routed into this study.

Distance from birthday. Participants were randomly assigned to recall either their most recent birthday (in the *recent* condition), or their birthday three years earlier (in the *distant* condition). They were asked to describe this birthday, and provide its date.

Participants were then asked to indicate their perceived subjective distance from the birthday: “Sometimes events tend to feel closer or further away, regardless of how long ago it actually occurred. Think about the event that you described for this study. Place the slider at the

point that best indicates how long ago that event feels to you.” Participants indicated their responses on two slider bars, ranging from 1 to 100, with the end points “feels very close” and “feels very far away” on one bar, and “feels like yesterday” and “feels very distant” on the other. These two items were averaged to create an index of perceived subjective distance (Cronbach’s $\alpha = .89$).

Birthday questions. Our primary dependent measures focus on people’s *current* evaluation and emotional reaction to the past birthday. We also asked identical questions about their remembered response *at the time* of their birthday and how they expected to feel one year in the *future*. Participants rated the importance of the birthday at its occurrence, at the present moment, and one year in the future, then reported their past, present, and anticipated future positive affect surrounding the birthday (four items: *how happy/loved/upset/disappointed were you about this birthday*, on a seven-point scale, with the endpoints *not at all* and *extremely* (upset and disappointed were reverse coded); Cronbach’s $\alpha = .90$ for past, $.86$ for present, and $.83$ for future). Additionally they indicated how this birthday compared to others that they had experienced, on a seven-point semantic differential scale in terms of fun (endpoints *more fun* and *less fun*), emotionality (endpoints *more emotional* and *less emotional*), memorability (endpoints *more memorable* and *less memorable*), and positivity (endpoints *more positive* and *more negative*; Cronbach’s $\alpha = .77$; higher scores indicate a more positive birthday compared to others). Finally, participants were asked several items about memory perspective and immersion taken from Ayduk and Kross (2010) (e.g. *to what extent did you feel like an immersed participant versus a distanced observer when recalling the birthday?*, on a seven-point scale, with endpoints *predominantly like an immersed participant* and *predominantly like a distanced observer*), as well as several others about their experiences thinking about this birthday prior to

and during the study (two items on a seven-point scale: *how often do you think about this birthday?*, with endpoints *not often at all* and *extremely often*; and *how easy or difficult was it for you to recall the factual details of this birthday?*, with endpoints *very difficult* and *very easy*), before completing a demographics section that included age, gender, and ethnicity.

Results and Discussion

Preliminary Analyses

First, we verified that there were differences in objective distance between the two conditions. Indeed, the most recent birthday was closer in objective time, about six months ago ($M_{\text{days}} = 174.01$, $SD = 96.69$) than the birthday three years ago, which was about three years and six months ago ($M_{\text{days}} = 1114.49$, $SD = 205.35$; $t(147.67) = -41.73$, $p < .001$, 95% CI = [-986.08, -894.87]). We also examined how closely our measure of subjective time was tied to our objective time condition. We found that subjective time was significantly closer when participants were considering a more recent ($M_{\text{subjective time}} = 59.12$, $SD = 24.39$) than a more distant birthday ($M_{\text{subjective time}} = 73.35$, $SD = 21.73$; $t(194) = -4.32$, $p < .001$, 95% CI = [-20.73, -7.73]).

Effects of Objective and Subjective Time on Responses to Past Birthdays

We again predicted that while participants may differ in their reactions to the recollection of a more distant or more recent event, in this case a birthday, such that the subjective time from that birthday would predict participant reactions above solely objective time. We conducted an objective time condition X subjective time multiple regression analysis, once again entering the effect coded (-1 = more recent and +1 = more distant) objective time condition at Step 1, the

mean-centered measure of subjective time in Step 2, and the interaction term: objective time X subjective time, in Step 3.¹¹

First, we examined the effect of objective time on responses to past birthdays. As shown in Table 6, some main effects emerged for whether people thought of a more distant or more recent birthday. Namely, participants saw the more recent birthday as more positively valenced, easier to recall, and more frequently thought about. We then examined the role of subjective time, over and above objective time, in step 2. Again, subjective time emerged as a significant predictor on the majority of the DVs. When the birthday felt subjectively closer in time, participants rated it as more important and more emotionally positive, and expected these appraisals to continue in the future. There was no main effect of subjective time on reports of positive affect at the time of their birthday, or whether a first- or third-person perspective was taken.¹²

We found one significant and one marginal objective time X subjective time interaction. Present importance of the birthday ($\beta = -.14$, $p = .041$, 95% CI = [-.02, -.0005], R^2 change = .02) and past importance of the birthday ($\beta = -.13$, $p = .058$, 95% CI = [-.02, .0003], R^2 change = .02) interactions were found; both had patterns whereby subjectively closer birthdays were deemed more important, but that this relationship was stronger when thinking about a more objectively distant birthday.

Secondary Analyses of Objective and Subjective Time

In addition to our primary analyses, we were once again able to use the dates given to us by our participants as a continuous measure of objective time. Of particular note in this analysis

¹¹ See Table 5 for means, standard deviations, and zero-order correlations between subjective distance and other variables.

¹² The pattern of results remains the same if controlling for past affect.

is that the objective measure is the participants' own birthdays; thus, we expect that the objective date given will be accurate whereas in other studies, precise dates of some events are likely not known exactly and could be subject to subjective phenomena influencing the remembered date. Keeping with our prior analyses, we performed separate analyses within each condition, due to our objective time conditions sampling dates from different time periods (within the last year in the close condition, or three years earlier in the distant condition).

We began by assessing the correlations between the number of days since the respondents' birthdays, and their reported feeling of subjective distance from that day. For participants who were recalling their most recent birthday, the two measures were marginally positively related, $r(94) = .19, p = .063$, while they were not at all related for participants recalling their birthday three years earlier, $r(102) = -.01, p = .915$.

We then conducted a set of regression analyses that parallel those in Study 1a, examining objective time (as measured by the number of days since the birthday) in Step 1, subjective time controlling for objective time in Step 2, and the interaction between the two in Step 3. We again expected to find a similar pattern of results as in our main analyses, with subjective perceptions of time predicting our dependent variables beyond the objective amount of time that had passed.

We observed a pattern remarkably consistent with Study 1a, both for more distant (see Table 7) and more recent (see Table 8) birthdays, whereby the number of days since an individual's birthday does not reliably predict most of our dependent variables, but the subjective feeling of time having passed does¹³. This analysis is particularly meaningful in this study, as it is our truest test of the role of objective time that is likely to be very high in accuracy, unaffected by subjective influences.

¹³ We found two objective time X subjective time interactions between both sets of analyses; once again, the general trend was that the effect of subjective time was stronger when the participant's birthday was objectively longer ago.

In sum, the objective date of one's birthday *did* appear to play a larger role in predicting positive affect surrounding that event than the objective distance of a target breakup did in predicting negative affect: individuals who recalled a more recent birthday did feel significantly more positive affect than those who recalled a more distant birthday, in contrast to the breakup study, in which objective distance did not predict present affect. However, participants' subjective distance from those same birthdays still contributed to their current emotional reactions and perceptions, above and beyond what could be explained solely by objective time. Regardless of the timing of the birthday, those who felt subjectively close to their past birthday felt even more positively about that day at present. This pattern suggests that subjective time is not only important when considering how past *harms* are healed, but that it is tied to the fading intensity of affect more generally (for positive and negative events), above and beyond objective time.

It is worth noting again that the sample in this study is not entirely representative of undergraduate participants, because students ineligible for Study 1a were routed to this study. Hence, the sample only consists of those students who had not experienced at least two breakups in their past. It is possible that this sample differs from the more general population in some aspects of personality or attitudes. However, we again have no specific reason to expect that this distinctive sample would differ meaningfully in their pattern of results, particularly as the recalled event is not specifically connected to a relationship context. Furthermore, if one of the sub-samples were to differ in some meaningful way (e.g. if they were more likely than average to produce a relationship between subjective time and present affect), we might expect the other sub-sample to differ in the opposite way (e.g. be less likely to produce such a relationship). Instead, we see a conceptually similar pattern of results from both subsamples.

Study 2

In Study 2, we sought to conduct a conceptual replication of the role of objective and subjective time from negative events on emotional responses, using a more diverse sample of individuals (particularly in age) than our prior student sample. Furthermore, we chose to extend our research into another domain, examining negative events from ongoing interpersonal relationships. Although Study 1a did look at relational events, it was in the context of the ending of a relationship, while in Study 2 we can investigate how perceptions of time in emotionally fraught relational events are related to the well-being of continuing relationships. In addition, we identified an individual difference variable – relationship attachment – that we believed might play a role in predicting perceptions of subjective time.

In Study 2, we allowed our participants to generate their own negatively-valenced recalled events, by asking about a time they had been transgressed against by a particular relationship partner who was nominated at the study outset. Our prior studies asked participants to identify a very specific type of event (a breakup or birthday), which ensured that participants were all thinking about a particular event type, but not necessarily events that were similar in emotional intensity, or even valence – one can imagine feeling relieved or happy about the end of an unhealthy relationship, or feeling unhappy about a birthday spent alone. By specifying in Study 2 that participants should identify an interpersonal transgression, we are increasing the likelihood that respondents will retrieve an event that was negative at least at the time of occurrence.

The interpersonal context of this memory also allowed us to examine one individual difference variable that may underlie why individuals differ in their perceptions of subjective time at least in an interpersonal domain – namely, their attachment style. Past research has

shown that individuals low in attachment anxiety are more likely to feel subjectively far from their partners' transgressions, while those high in attachment anxiety feel much closer to transgressions; events that are subjectively close, in turn, are brought to mind more often in other contexts, which leads to more maladaptive behaviour within the relationship (Cortes & Wilson, 2016). Similarly, we predicted that individuals who were low in secure attachment (those high in anxious and/or avoidant attachment) would feel closer to past transgressions, which would in turn predict more continued negative affect about the past incident.

Method

Participants

Two hundred and seventy-seven American residents were recruited to participate in an online study via Amazon's Mechanical Turk in exchange for \$0.75. Sixteen participants did not complete the full survey, with most discontinuing after a section requiring writing. Ten participants were excluded from analyses for failing at least two of three attention check questions, and seventeen participants were excluded for writing about a relationship that had ended, contrary to instructions. Finally, forty-two participants were excluded for choosing a memory that did not fall near the given date parameters. Participants were assigned to recall an event *from the past month or from a year ago or more*; we allowed some flexibility in those date parameters (e.g., if participants chose a recent event that was a bit more than a month old, etc). Before analyses were conducted, researchers chose a zero-day minimum and 90 day maximum for recent (within one month) memories, and a 180 day minimum and a maximum of three standard deviations above the mean (e.g. 5431.6 days) for distant (a year ago or more)

memories¹⁴. This left one hundred and ninety participants in the final analyses ($M_{\text{age}} = 33.6$, $SD = 12.3$; 127 female, 61 male, 2 undisclosed; 74.2% White).

Procedure

Interpersonal relationship questions. First, all participants were asked to choose an individual with whom they had an existing interpersonal relationship of more than one year. They were asked to indicate the length of this relationship, the gender of this individual, the primary type of relationship (59.1% of relationships were romantic, 28.8% were friendships, 8.1% were among family members, and 4.0% were another relationship type¹⁵). Participants were then given the nine-item Relationship Structures Questionnaire (Fraley, Heffernan, Vicary, & Brumbach, 2011), a relationship-specific attachment questionnaire, with six items relating to attachment-related avoidance (e.g. *I prefer not to show this person how I feel deep down*, on a six-point scale, with endpoints *strongly disagree* to *strongly agree*; items coded so that higher scores reflected less avoidant attachment; Cronbach's $\alpha = .88$), and three items relating to attachment-related anxiety (e.g. *I often worry that this person doesn't really care for me*, on a six-point scale, with endpoints *strongly disagree* to *strongly agree*; items coded so that higher scores reflected less anxious attachment; Cronbach's $\alpha = .89$). Finally, participants were also given three items pertaining to satisfaction with their present relationship: "how satisfied are you with this relationship", "how content are you with this relationship", "how happy are you with this relationship", and "how close are you with your partner?" (Cronbach's $\alpha = .97$).

¹⁴ Results are not substantively different if cases at all dates are included, regardless of following condition instructions; or if a more stringent maximum date in the distant condition (e.g. five years) is implemented.

¹⁵ We did consider relationship type as a covariate in this study, but preliminary analyses indicated it did not interact with variables of interest. Reported results do not change in pattern or significance if controlling for relationship type; therefore, we report the results without any covariates included.

Distance from interpersonal transgression. Participants were asked to recall an incident in which the individual they had chosen had hurt or wronged them in some way. Participants were randomly assigned to either recall an incident within the last month (in the *recent* condition), or a year or more ago (in the *distant* condition). They were asked to describe this incident, and provide its approximate date.

Participants were also asked to indicate their perceived subjective distance from this interpersonal transgression on two slider bars, ranging from 1 to 100, with the end points “feels very close” and “feels very far away” on one bar, and “feels like yesterday” and “feels very distant” on the other. These two items were averaged to create an index of perceived subjective distance (Cronbach’s $\alpha = .95$).

Interpersonal transgression questions. Again, our primary dependent measures focus on people’s *current* evaluation and emotional reaction to this interpersonal transgression. We also asked identical questions about their remembered response *at the time* of the transgression and how they expected to feel about it one year in the *future*. Participants reported their past, present, and anticipated future negative affect surrounding the transgression (three items: *how upset/angry/hurt were you by this act*, on a seven-point scale, with the endpoints *not at all* and *extremely*; Cronbach’s $\alpha = .81$ for past, $.93$ for present, and $.96$ for future), as well as its importance at all three time points. Additionally they indicated how negatively they thought about the transgression perpetrator (four items on a seven-point semantic differential scale; endpoints were *moral* and *immoral*, *good* and *bad*, *trustworthy* and *untrustworthy*, and *likeable* and *unlikeable*; Cronbach’s $\alpha = .90$; higher scores indicate more negative perceptions), and about the act itself (three items on a seven-point semantic differential scale; endpoints were *moral* and *immoral*, *good* and *bad*, and *not serious* and *serious*; Cronbach’s $\alpha = .72$; higher scores indicate a

more negative act), as well as an eleven item measure of negative relational reactions (e.g. *I have decreased contact with this person since their act*, on a seven-point scale, with endpoints *strongly disagree* to *strongly agree*; Cronbach's $\alpha = .92$; higher scores indicate more negative relational reactions). Participants were also asked about levels of closeness to the chosen individual prior to their act, immediately after their act, and at the present moment (on both a seven-point Likert scale, with endpoints *very distant* and *very close*, and an eight-point self-other circle overlap scale, with one being no overlap, and eight being complete overlap), as well as their experiences thinking and talking about this transgression prior to and during the study (three items on a seven-point scale: *how often have you brought up this past event with this person?*, with endpoints *not often at all* and *extremely often*; *how often do you think about this event?*, with endpoints *not often at all* and *extremely often*; and *how easy or difficult was it for you to recall this event?*, with endpoints *very difficult* and *very easy*). Finally, participants were asked to indicate their belief that the other person could change (two items: *how likely do you think it is that this person could change?* (reverse coded) on a seven-point scale, with endpoints *very unlikely* and *very likely*; and *this person is incapable of change* on a seven-point scale, with endpoints *strongly disagree* and *strongly agree*; Cronbach's $\alpha = .66$), as well as an attention check item (*do you have an ongoing relationship with this person?*), before completing a demographics section that included age, gender, and ethnicity.

Results and Discussion

Preliminary Analyses

We first looked at the objective calendar distance from the interpersonal transgressions provided by our participants by condition. Participants in the recent condition (within the last month) thought of an event that was, on average, three weeks prior ($M_{\text{days}} = 21.18$, $SD = 18.87$),

while participants in the distant condition (a year ago or more) thought of an event that was just over two and a half years earlier ($M_{\text{days}} = 953.38$, $SD = 898.81$); Welch's t -test indicated that the two means were significantly different ($t(94.08) = -10.11$, $p < .001$, 95% CI = [-1115.34, -749.06]).

Next, we determined how our measure of subjective time related to our objective time condition. We found that participants' reports of subjective time were significantly predicted by whether they remembered a more recent ($M = 44.33$) or more distant ($M = 67.77$) event, $F(1,188) = 28.77$, $p < .001$, $\eta^2 = .13$. Subjective time was also predicted by the number of days reported since the negative event, $b = .01$, $\beta = .27$, $t(188) = 3.82$, $p < .001$, 95% CI = [.01, .02].

Effects of Objective and Subjective Time on Responses to Past Transgressions

Our key prediction, again, was that while participants may differ in their reactions to interpersonal transgressions in their more recent or distant pasts, their perception of subjective distance from the event would predict their emotions and cognitions beyond the effect of objective distance alone. We again conducted an objective time condition X subjective time multiple regression analysis, entering the effect coded (-1 = more recent (1 month ago) and +1 = more distant (1 year ago)) objective time condition at Step 1, the mean-centered measure of subjective time in Step 2, and the interaction term: objective time X subjective time, in Step 3.¹⁶

We first examined the effect of our objective time condition on participant reactions to their reported interpersonal transgressions. Participants in the objectively distant condition reported that at the time of the incident, they felt a greater amount of negative affect, and ascribed more importance to the event, and judged the act itself marginally more negatively at present (see Table 10). This pattern differs from that of previous studies, and likely reflects the

¹⁶ See Table 9 for means, standard deviations, and zero-order correlations between subjective distance and other variables.

fact that people are able to select more serious/memorable transgressions from a year or more ago compared to the relatively limited options they may have to select from in the past month. Participants also reported feeling less close to the individual who committed the transgression immediately following a more distant incident. When examining the role of subjective time above and beyond that of objective time, it again emerges as a significant predictor of most dependent variables. Consistent with past studies, events that *feel* closer in time are rated as evoking greater negative affect and importance in the present and future, along with harsher judgments of the close other and their actions, less interpersonal closeness after the act, and more frequent access of that memory.¹⁷

We found one significant and three marginal objective time X subjective time interactions, none of which were predicted nor do they meaningfully alter interpretations of the central pattern of main effects. Predictions of future negative affect ($\beta = -.14$, $p = .043$, 95% CI = [-.01, .00], R^2 change = .02) revealed a larger effect of subjective time in the one year than one month condition. The three marginal interactions are reported here but not broken down or interpreted further: Predictions of future event importance ($\beta = -.12$, $p = .066$, 95% CI = [-.02, .00], R^2 change = .02), relationship closeness before the transgression ($\beta = -.13$, $p = .077$, 95% CI = [-.01, .001], R^2 change = .02), and relationship closeness after the transgression ($\beta = -.13$, $p = .073$, 95% CI = [-.02, .001], R^2 change = .02).

Secondary Analyses of Objective and Subjective Time

Once again, we conducted secondary analyses using the dates provided by participants as a continuous measure of objective time, performing separate analyses within each objective time condition. We found that correlationally, the number of days since the transgression was related

¹⁷ Patterns remain the same when controlling for past affect.

to subjective perceptions of time within the more recent condition, $r(97) = .36, p < .001$, but not within the more distant condition, $r(101) = .10, p = .301$.

We then examined the relationship between objective time, subjective time, and our dependent variables in a series of regression analyses, consistent with our prior analyses: our continuous measure of objective time (number of days since the transgression) in Step 1; our continuous measure of subjective time, controlling for objective time, in Step 2; and the interaction between objective and subjective time in Step 3.

We find that objective time does a poor job of predicting our outcome variables for objectively older transgressions (see Table 11), while it actually does predict many outcomes, including affect and importance at present, for objectively newer transgressions (see Table 12). In other words, whether an event happened a day ago versus a week ago matters more than whether an event occurred one year ago versus one year and one week ago. However, once again, regardless of condition, perceptions of subjective time predict these same outcomes above and beyond the effect of objective time.¹⁸

Mediation Analyses

Though it is clear that individual perceptions of subjective time are related to important emotional outcomes, why might these perceptions form in the first place, and why might they vary to such a great extent? We thought that individual differences in how people cope with and process negative information might help explain the variation in subjective time estimates. We hypothesized that in the context of relational transgressions, differences in subjective time

¹⁸ We find one interaction between objective and subjective time, when examining the propensity for individuals to bring up the transgression with the other individual. We find that among recent (within one month) events, the likelihood of extremely recent events (-1 SD in days since) being brought up is related to the feeling of subjective distance from the event, with events that feel closer being brought up more often than those that feel distant; however, relatively distant (+1SD) events are not affected by subjective distance.

perception may be predicted by individual differences in attachment. We conducted regression analyses predicting subjective time with both anxious and avoidant attachment (controlling for objective time¹⁹). Recalling that the scales were scored such that higher scores reflect more secure attachment, we found that participants with a more avoidant ($\beta = .27, p < .001, 95\% \text{ CI} = [.004, .01]$) or more anxious ($\beta = .22, p < .001, 95\% \text{ CI} = .003, .02$) relationship attachment style (lower scores) reported feeling subjectively closer to transgressions (or conversely, securely attached participants reported greater subjective distance). Translating this pattern into concrete terms (see Figure 1), the average participant who would be considered ‘securely attached’ (e.g., 1SD above the mean for reverse-coded avoidant attachment) report their one-month-ago event as around the midpoint on subjective distance ($M = 52.3$) and their one-year-ago event as quite distant ($M = 75.4$). In contrast, a person considered highly ‘avoidant’ in attachment style (e.g., 1SD below the mean on reverse-coded avoidant attachment) would rate the subjective distance of an event one year ago as 59.3 on a 100-point scale (while an event one month ago would be well below the midpoint, at 37.6). In other words, for an avoidantly attached individual, an event from a year ago seems nearly as subjectively close in time as an event from a month ago for a securely attached person.²⁰ Furthermore, attachment style (both avoidant and anxious) was correlated with most, but not all, of our dependent variables (see Table 13) such that more avoidant/anxious attachment was related to more negative affective and cognitive responses to transgressions.

¹⁹ Objective time is not related to anxious or avoidant attachment, either when subjective time is included as a covariate ($ps > .896$) or when it is not ($ps > .136$).

²⁰ A similar, but less extreme, pattern is found for anxious attachment: individuals low in anxious attachment report their one-month-ago event as around the midpoint ($M = 54.0$), and their one-year-ago event as quite distant ($M = 71.1$), while someone high in attachment rates their one-month-ago event as quite close ($M = 35.6$), and their one-year-ago event as relatively close ($M = 64.9$) compared to the securely attached person), though this difference is smaller than when examining avoidant attachment (see Figure 2).

Following this, we conducted a series of mediation analyses. Though in some cases there was no direct effect between attachment and the dependent variables in question, current views of statistical procedures (e.g. Hayes, 2009; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Shrout & Bolder, 2002) do not require a significant direct effect in order to examine indirect effects. Thus, we tested two models, to see whether perceptions of subjective time (controlling for objective time) mediated the relationship between attachment style and our dependent variables.

The first series of mediations were conducted using avoidant attachment as the independent variable, examining how perceptions of subjective time mediated the relationship between avoidant attachment (reverse coded, with higher numbers indicating more secure attachment) and our set of dependent variables (for example, present affect), controlling for objective time condition. Thus, our hypothesis was that a more securely attached (versus avoidantly attached) individual would perceive the past transgression as subjectively farther, which would in turn predict less negative outcomes for the individual (e.g. less negative affect at present). The second series of mediations was identical, except that avoidant attachment was replaced by anxious attachment (and likewise reverse coded). We conducted all mediations using Model 6 of the SPSS macro PROCESS (Hayes, 2012), conducted with 5,000 bootstrap samples. All paths for the full models are illustrated in Figure 3, which includes the coefficients for Model 1, using present affect as the outcome variable, while all coefficients are displayed in Tables 14 (avoidant attachment) and 15 (anxious attachment).

For both models, the indirect effect of attachment style on our dependent variables via subjective distance was significant for all but one dependent variable. For both attachment subscales, this indirect effect did not significantly predict participant reports of their closeness to

their close other pre-transgression, which would be expected, given that subjective time from a given transgression should not predict one's relationship closeness *before* that transgression. For all other dependent variables, we find identical patterns. Having a more (versus less) secure attachment style predicts greater subjective distance from an interpersonal transgression, which in turn predicts less negative outcomes for the participant, whether relational, emotional, or phenomenological. Thus, it seems that more securely attached individuals are subjectively distanced from negative incidents that are equally distant in real time, and in turn buffered from the negative consequences of that incident.

We also conducted a parallel set of mediations where we reversed the order of the mediator and dependent variables (i.e. each dependent variable became a mediator, with subjective time as the outcome variable). We found that for most of our mediations, but not all, the reversed mediation was also significant (as indicated on Tables 14 and 15). This is not surprising, given that the link between subjective time and emotion could be bidirectional – while subjective time could alter one's emotional reaction, so too could one's emotional reaction alter one's perception of subjective time. In addition, it is possible that attachment could operate as a third variable, shaping both perceptions of subjective time and emotional reactions, rather than those two variables relating directly to one another. Thus, in order to draw any conclusions about subjective time's causal influence, it is necessary to not just measure, but also manipulate perceptions of subjective time.

Study 3

Across the first three studies, subjective distance played a powerful role over and above objective time. However, we cannot make causal conclusions about subjective time because only objective time was manipulated; subjective time was always measured. The goal of Study 3 was

to experimentally manipulate perceptions of subjective time, in order to determine its causal role in predicting emotional responses to negative events.

Precursors to Study 3

After conducting Study 1 and 2, we conducted several pilot studies attempting to develop an effective subjective time manipulation from a past event. Some of our initial attempts were ineffective and did not alter subjective time at all, and one was partially successful and informed the improved design used in Study 3. These pilot studies will be described in brief.

In one set of pilot studies, we attempted to alter subjective time using a manipulation of self-perspective (either self-immersed or self-distanced) based on Kross et al. (2005). As previously noted, self-distancing is not the same as subjective temporal distance, but the two *can* be related, and we theorized that participants who self-distanced might also feel subjectively farther from a previous event, versus those who self-immersed. We used an interpersonal transgression context, as seen in Study 2, for both pilot studies. Participants were instructed to either re-live the memory in detail (self-immersed) or recall it from an observer's vantage point (self-distanced); in the second study, we attempted to reinforce the self-perspective manipulation by introducing additional step-by-step instructions. However, in both studies, post-manipulation subjective distance was not affected by the manipulation, nor were the vast majority of dependent variables. Indeed, the only variables that were affected by the manipulation across both studies were manipulation check items about self-perspective drawn from Kross and Ayduk (2010). Thus, this manipulation was not an effective way to influence subjective time, and the results are not explored in depth.

Next, we decided to create and pilot a new manipulation of subjective distance that more directly targets the temporal aspects of the memory. Our initial pilot test was somewhat more

promising. We chose to focus on a less interpersonal domain for our past event, asking people to recall a personally embarrassing event. We asked participants to describe the event from a present-tense (subjectively close) or past-tense (subjectively distant) perspective; this manipulation will be described in greater detail in Study 3.

We found that our manipulation was effective at altering perceptions of subjective time. Furthermore, the manipulation did have an impact on several of our dependent variables (e.g. feeling like a different person now; feeling like a distanced observer) in the expected direction. The manipulation did not reliably affect emotionality items however. There are several potential explanations for this failure (as an example, there was some evidence that recalled embarrassment might be more emotionally ambiguous than the other kinds of experiences we have examined), but no clear answers. Thus, in the follow-up (the current Study 3) we chose to use the same manipulation (with minor improvements) while asking participants to recall a different negative event.

The Present Study

In Study 3, we once again examined a different context, extending this broadly applicable phenomenon – this time, asking participants about personal failures – and rather than simply measure perceptions of subjective distance, we manipulated those perceptions, by asking participants to write a narrative passage in either past tense or present tense. We predicted that participants who wrote about a personal failure in past tense, versus present tense, would feel subjectively farther from that failure, regardless of how long ago it had actually occurred. Furthermore, those participants would deem the incident as less emotional, and would show similar phenomenological responses (e.g. less attention and fluency) as when incidents are naturalistically subjectively distant.

Method

Participants

Three hundred and ten American residents were recruited to participate in an online study via Amazon's Mechanical Turk in exchange for \$1.00. Eighty participants were excluded for problematic responses to the key written response (describe a past failure following specific instructions): fifty-four did not respond at all, and twenty-six did not follow instructions appropriately (reasons include writing in an incorrect tense, specifying events that were ongoing, or writing about non-failures). Twenty-four participants were excluded from analyses for failing at least two of three attention check questions, and forty participants were excluded for choosing a memory that did not fall near the given date parameters; before analyses were conducted, researchers chose a zero-day minimum and 120 day maximum for recent (approximately one month ago) memories, and a 120 day minimum and a maximum of three standard deviations above the mean (e.g. 1307.5 days) for distant (approximately one year ago) memories.²¹ Seventeen fell into more than one of the above exclusion categories. Thus, a total of one hundred and eighty-three participants were included in the final analyses ($M_{\text{age}} = 35.6$, $SD = 12.5$; 101 female, 81 male, 1 agender; 78.1% White).

Procedure

Objective and subjective distance conditions. All participants were asked to recall a personal failure they had experienced in the past, and given a general description of what such a failure could be (e.g. failing to accomplish a goal, doing poorly on a task, getting negative

²¹ This criteria differs from Study 2 because of the difference in instructions: participants were asked to think of an event "approximately one month [year] in the past", rather than "in the past month" or "a year or more in the past" as instructed in the prior study. This led to more events that were older than one month in the recent condition, and that were more recent than a year ago in the distant condition. The pattern of results remains similar if the same cutoff criteria are applied to both studies.

feedback). Participants were randomly assigned to recall a failure from either one month in the past (in the *recent* condition) or one year in the past (in the *distant* condition). They were asked to provide the approximate date of the incident, and to indicate how distressing the incident was at the time that it occurred (seven-point scale, with endpoints *not at all* and *very much so*).

Participants were then randomly assigned to one of two subjective distance conditions. In the *subjectively close* condition, participants were asked to write about the incident in the present tense, as if it were occurring at the very moment, and were asked to begin their story with the sentence stem “at this moment, I am...”. In the *subjectively far* condition, participants were asked to write about the incident in the past tense, as if they were narrating the incident retrospectively, and were asked to begin their story with the sentence stem “in the past, I was...”. Participants were then asked to indicate their perceptions of subjective distance from the event. Due to concerns that the introduction to the measure (“sometimes events tend to feel closer or further away, regardless of how long ago it actually occurred”) could be influencing responses in some way, we chose to remove this sentence, and only include the basic instructions (“Think about the incident you described. Place the slider at the point that best indicates how long ago that event feels to you”). We again measured subjective time on two slider bars that ranged from 1 to 100, with the end points “1 - feels very close” and “100 - feels very far away” on one bar, and “1 - feels like yesterday” and “100 - feels very distant” on the other. These two items were averaged to create an index of perceived subjective distance (Cronbach’s $\alpha = .95$).

Personal failure questions. Our variables of greatest interest once again probed assessments of *present* evaluative and affective judgments, while also including parallel measures for *past* (at the time of the failure) and *future* (in one year) judgments. Participants reported their negative affect at all three time points (five items: *how*

upset/worried/disappointed/ashamed/distressed are you about this event, on a seven-point scale, with the endpoints *not at all* and *extremely*; Cronbach's $\alpha = .88$ for past, $.90$ for present, and $.93$ for future), as well as the perceived importance of the incident at all three points on the same scale.

Participants were then asked a series of five questions about their experiences taking the survey and thinking about the event: *how easy or difficult was it for you to recall the factual details of this event?* (on a seven-point scale, with endpoints *very difficult* and *very easy*); *how vividly do you remember the details of this event?* (on a seven-point scale, with endpoints *not vividly at all* and *very vividly*), and the three memory phenomenology questions (Kross & Ayduk, 2012) as in studies 1 and 2. Finally, participants were asked to complete a demographics section, including age, gender, and ethnicity.

Results and Discussion

Manipulation Checks and Preliminary Analyses

Reports of objective distance. We began by examining the objective calendar distance from the personal failures reported by our participants, according to participant condition. Because of the bimodal nature of this data (a cluster of objective times around one month and another, wider cluster around one year), along with heterogeneous variances, we could not conduct the typical 2 (objective time condition: *recent* vs. *distant*) X 2 (subjective time condition: *subjectively close* vs. *subjectively far*) ANOVA for this dependent variable. Instead, we conducted a set of one-way ANOVAs, using objective distance condition as the predictor and splitting the file by subjective time condition, and then using subjective distance condition as the predictor and splitting the file by objective time condition. This allowed us to use Welch's ANOVA, which allows for dependent variables with heterogeneous variances, but cannot be

used for a factorial design. The purpose of this analysis is to confirm the effectiveness of the two manipulations. The objective time manipulation is expected to affect objective time in months, and the subjective time manipulation is expected to affect subjective time judgments. We have no hypothesis about whether the objective time manipulation will affect subjective time (objective time sometimes affects subjective time but the effect is weak in the presence of other psychological factors). The subjective time manipulation is not expected to affect objective time because it was presented after the objective time of the event was recorded, therefore any effect would be a failure of random assignment.

There was a main effect of objective time condition on the calendar distance since the event, with participants in the *recent* condition (about a month ago) writing about an event that was, on average, slightly over one month ago ($M_{\text{days}} = 33.20$, $SE = 2.31$), while participants in the *distant* condition wrote about an event that was, on average, slightly less than a year ago ($M_{\text{days}} = 358.04$, $SE = 16.41$); these values differed significantly, $F(1, 85.24) = 459.61$, $p < .001$, $\eta^2 = .72$. The same main effect was found when analyses were performed on only participants within each of the *subjectively close* and *subjectively far* conditions.

As expected, there was no main effect of subjective time condition on objective time estimates (collapsed across conditions), with individuals in the *subjectively close* condition thinking about an event about the same number of days away ($M_{\text{days}} = 189.98$, $SE = 23.16$) as participants in the *subjectively far* condition ($M_{\text{days}} = 171.97$, $SE = 17.02$), $F(1, 161.31) = .40$, $p = .537$. Breaking it down by objective time condition, there was also no main effect of subjective distance condition within the objectively *recent* condition. In the objectively *distant* condition, however, we did see a main effect of subjective condition, whereby those in the *subjectively close* condition thought about an event slightly more distant ($M_{\text{days}} = 394.24$, $SE = 28.92$) than

participants in the *subjectively far* condition ($M_{days} = 327.47$, $SE = 16.88$), $F(1, 81) = 4.28$, $p = .042$, $\eta^2 = .05$. Since the subjective time manipulation came after objective time estimates, this difference can only be a failure of random assignment. Further investigation revealed that this effect was primarily driven by one participant's distant memory (1291 days ago), and when this participant was excluded, the two means were not significantly different. Because the pattern of results were otherwise largely the same whether or not this participant was excluded, we retained them in the final analysis, given that they did not fall as an outlier in our stated cutoff of +3 SD above the mean (translating to 1307.5 days).

Reports of subjective distance. We also examined whether participant reports of subjective distance varied as predicted according to the subjective distance manipulation. Recalling that larger numbers indicate a greater degree of subjective distance, we found the expected main effect of subjective distance condition, such that participants in the *subjectively close* condition felt significantly closer to their reported event ($M = 25.3$, $SE = 2.9$) than those in the *subjectively far* condition ($M = 39.3$, $SD = 2.7$); $F(1, 178) = 12.8$, $p < .001$, $\eta^2 = .07$. There was no main effect of objective distance condition, nor any interactions between the two conditions.

Baseline event distress. Finally, we examined whether the personal failures being brought to mind differed based on either condition. Conducting a two-way ANOVA, we found that objective time condition was related to how distressing the event was at the time it occurred, $F(1, 179) = 5.12$, $p = .025$, $\eta^2 = .03$, whereby more recent personal failures were seen as less distressing ($M = 5.36$, $SE = .13$) than those that occurred a year earlier ($M = 5.80$, $SE = .15$), likely because people had more options to select from in the more distant past than in the constrained recent one-month window, and more severe events may be more likely to come to

mind despite the passage of time. The subjective distance condition did not predict distress, $F(1, 179) = .02, p = .897$, nor was there an interaction between conditions, $F(1, 179) = .41, p = .672$. Because it seemed that participants were bringing to mind events of differing seriousness in the objectively recent and distant conditions, we ran analyses including distress as a covariate.

Effects of Objective and Subjective Time on Responses to Past Transgressions

We conducted a series of ANCOVAs, using both objective and subjective distance conditions as predictors, and past distress as a covariate, in order to assess the effects of our conditions on our dependent variables of interest.²² Results (see Table 17 for adjusted means, SEs, and statistical tests) indicated a main effect of both the objective and subjective distance conditions on present affect (but no interaction), such that participants felt more negative affect both when they recalled a more recent memory, and when they were made to feel subjectively closer to that event. A significant main effect of objective time was also observed for two of the secondary dependent variables: present importance, and re-experiencing emotions. Participants who recalled a personal failure from the past month viewed it as more important at present, and reported more strongly re-experiencing the same emotions they originally felt, than participants recalling a year-old failure. Finally, there was a main effect of subjective time condition on four of the secondary dependent variables. Participants in the subjectively close condition who described the event in present-tense (versus the subjectively far condition) found the event easier to recall, reported feeling more immersed when recalling the memory, reported re-experiencing their original emotions more, and remembered the event more vividly. Subjectively close participants were also marginally more likely to anticipate the event holding greater importance

²² See Table 16 for means, standard deviations, and zero-order correlations between measured subjective time and other variables.

in the future. There were no significant interactions between objective and subjective time conditions (all $ps > .207$).²³ Thus, it seems that our manipulation of subjective time had an effect on in-the-moment affect for participants, independent of the actual amount of time that had passed since the personal failure.

It is important to note that while our manipulation does affect perceptions of subjective distance, it is possible that its effects extend beyond the targeted construct, having a broader impact on participants than intended. While our measure of subjective time asks about events feeling like the recent versus distant past, our manipulation has participants write about the event either in the present or past tense. Furthermore, the act of writing about the events from each perspective could activate differences in things like immersion or emotional focus; though we were careful to avoid using any emotional language in our manipulation instructions, it is still possible that participants may have done this without prompting. Nevertheless, this intervention shows promise as an effective way to change perceptions of subjective distance.

Secondary Analyses of Objective and Subjective Time

Although our manipulation did affect participant perceptions of subjective time, it may not have entirely over-ridden pre-existing feelings of distance from the failure event. Indeed, while the mean difference in our subjective distance manipulation check was 14.3 on a one hundred point scale, the standard deviation of this check within each condition was considerably larger (25.2 in the close condition and 27.3 in the far condition). Thus, it seemed that a great deal of variance in perceptions of subjective distance was left uncaptured. Furthermore, we once again asked for the date of the personal failure, allowing us to create a continuous measure of objective distance. Thus, we conducted a series of analyses that parallel our secondary analyses

²³ An extremely similar pattern emerged when past distress was not controlled for (see Table 18).

in the prior studies, where we looked at the effects of the continuous measure of objective time (number of days since the event) as well as the continuous measure of subjective time (ratings on our subjective distance manipulation check), within each of our four condition combinations: objectively close and subjectively close; objectively close and subjectively far; objectively far and subjectively close; and objectively far and subjectively far. Given the relatively low sample size within each of these four cells, we present this as highly exploratory work.

First, we examined the correlations between our continuous objective and subjective distance measures. We found one marginally significant correlation between the two (in the objectively close and subjectively far condition), $r(51) = .25, p = .082$; the other correlations were non-significant, $r_s < .22, p_s > .137$.

We then conducted a series of multiple regression analyses, consistent with those performed in the first two studies, where we entered objective time (the number of days since the failure) in Step 1, subjective time (the subjective time manipulation check) in Step 2, and the interaction between the two in Step 3; this same procedure was used within each of our four conditions. We expected to see a pattern similar to that found in prior studies, whereby individual perceptions of subjective time would predict responses to the dependent variables above and beyond any effect of objective time. We did not have predictions for any interactions, especially given the relatively small sample size within each condition.

Once again, we find a pattern of results strikingly similar to past studies. Within all four conditions (see Tables 19-22), we see that the number of days that have passed is rarely related to our outcome variables. However, once again, it is participants' perceptions of subjective distance that predict these outcomes – in particular, across all four conditions, participant reports

of subjective distance perceptions are strongly related to present affect and importance, as well as predictions of future affect.²⁴

General Discussion

In this program of research, we have concluded that when thinking about a past event, particularly one that is negatively valenced, how far away it *feels* may be more important than how far it *is*. This research is the first to systematically pit objective and subjective time against one another and examine their relative role in the transformation of emotional past experience; across all studies, subjective time plays a powerful role.

In these four studies, the passage of objective time has some effect on present experience – it may heal *some* wounds, but incompletely, inconsistently, and unreliably. In contrast, subjective time appears to more reliably predict how individuals feel about past negative events, beyond any effect that objective time may have – the further away an event felt, the better our participants felt about it. In three of our studies, we found that this pattern replicated across a wide variety of contexts: romantic breakups, interpersonal wrongdoing in ongoing relationships, and personal failures. In Study 1b, we also found a corresponding pattern for a generally positive event, one's own birthday, whereby feeling closer prompted more positive affect.

Throughout all studies, we used multiple methods to anchor objective time in a way that has not been accomplished in subjective time research. Rather than relying solely on self-reports from a narrow band of time, we asked participants to recall specific events that happened at

²⁴ We did find a number of objective X subjective time interactions within this series of analyses. There were twelve interactions in total, with ten of those within conditions where objective and subjective time were manipulated in opposing ways (that is, the objectively close and subjectively far condition, and the objectively far and subjectively close condition). Once again, we will not fully interpret these interactions, given their unpredicted nature, and the extremely small number of participants (cell size ranging from 38 - 51). More generally, we found a trend that the effect of subjective distance was weaker for participants who were at the extremes of objective distance – that is, participants in the objectively recent condition who thought of an extremely recent memory, and participants in the objectively distant condition who thought of an extremely distant memory.

objectively different points in time along one's personal timeline (breakups), to recall events of a certain type that happened in one of two specific time periods (transgressions and failures), or a combination of both methods (birthdays). Although each method is not without limitations, this varied approach allowed us to demonstrate the incremental contributions being made by subjective time, even with vast differences in objective time reported.

Study 2 demonstrated that some individual differences – in this case, secure or nonsecure (anxious or avoidant) attachment style – may be related to the extent to which people feel subjective distance from an event. This is not to suggest that attachment is the primary driver of perceptions of subjective time; it is likely that a wide variety of individual difference variables, such as personality traits or other deeply ingrained beliefs, could play a role in the formation of these subjective perceptions, depending on the event in question. More generally, we would predict that individuals with more adaptive tendencies (e.g. secure attachment, high self-esteem, high resiliency) would be more likely to psychologically distance themselves from negative events, while keeping positive events psychologically closer. However, more work must be done in order to assess the truth of this prediction.

Finally, in Study 3, we used a simple writing task to manipulate the subjective distance from a past failure, and in turn, the emotional perceptions of this event. Although further research needs to be done to investigate this new manipulation, it is a promising direction for the study of subjective time, and provides the first evidence of a causal relationship between subjective time and emotional outcomes.

This research is not without limitations. All incidents reported by participants were captured retrospectively. This has several implications. First, we cannot independently verify the accuracy of our objective time conditions and measurements: participants may be incorrect in

their recollections of dates, or may be bringing to mind events that do not truly fall into the specified time periods. We attempted to rectify this in a few ways – we varied the recalled events, including one (participant birthdays) that should be quite accurately dated. We also tried to ensure a large enough divide between objective time conditions when possible (for example, asking for an event either one month or one year earlier), so that even if participants were somewhat inaccurate, they would not be so inaccurate that they would bring to mind an event that would better fit into the opposite condition. Nonetheless, there may still be some errors in accuracy that we could not account for.

Second, due to the nature of recollection, participants may be bringing to mind different types of experiences for each time period than a random sampling of events that would occur naturalistically at each of those time points. Again, with our diversity of events, we included some (like birthdays and breakups, where we identified which ones to recall) where the specific events were not chosen by participants, but which may nonetheless have more variance than anticipated – a birthday may be a largely positive event for most, but this is not universally true. Conversely, other events (like transgressions and failures) were defined in part by their emotional valence, and thus vary less between participants, but may differ based on objective distance in time – an argument or debacle that can still be recalled a year later is likely to differ from one from the past few weeks that is still fresh in one’s mind. Thus, the distant events from these studies are likely qualitatively different than those that occurred more recently due to the mere fact that they have persisted so long in our participants’ memories.

Because of these reasons, it is important to replicate these results in future research using a longitudinal design. If participants identify important events as they occur, we could ensure we have more accurate calendar dates, allowing for more precise analyses involving objective time.

We could also choose events that have similar characteristics, ensuring the same valence across participants, or control for variables like affect at the time of the incident, with greater confidence that these measures are accurate. We would be able to confirm that the relative effects of objective and subjective time apply to a greater number of events, including ones that may have been forgotten over time. Most importantly, this would help to eliminate the possibility of selection bias - that only the objectively distant events that come to mind (and thus presumably still matter to participants) are subject to the effects of subjective time.

Another reason to invest in a longitudinal design is to follow up with participants after the completion of the study, and see whether any subjective time interventions have longstanding effects. We have shown that perceptions of subjective time can be transformed via a brief written intervention, and that this intervention is tied to changes in emotion at the present time, but have no information as to whether this effect is only temporary, or whether it persists over time.

Before any investment in longitudinal research, however, it is necessary to conduct replications of the findings of Study 3. Though this does provide an intriguing new avenue by which subjective time could be manipulated, this study is the only research that has demonstrated changes both in subjective time perception and emotional outcomes. If the study does replicate, it is also possible that this manipulation is only effective within limited contexts, so future conceptual replications using other categories of past events are needed in order to assess its overall utility.

Provided that future replications are successful, this research may speak to a potential new path towards helping individuals cope with negative events. There is a clear link between subjective time and emotion, which we believe is bidirectional – while perceptions of subjective distance are created and guided in part by emotion, so too is emotion guided by subjective

distance, as we found in Study 3. Thus, by altering perceptions of subjective time, we may too alter perceptions of emotional events. If time can help heal wounds, and the *feeling* of time is more powerful than calendar time, this is good news, because subjective time is relatively malleable – in our research, it was possible to alter perceived time using a brief narrative intervention. This is in stark contrast to objective time, which cannot be altered by any process other than waiting. It is also plausible that subjective time is more feasible to alter than emotions themselves as a first step toward healing. Although other interventions that work directly on alleviating negative emotions may work with some effort to promote healing and to gain distance from a painful event (e.g. Neacsiu, Bohus, & Linehan, 2014; Greenberg, 2004), it may be that even these emotion-focused efforts will be more effective when people gain some psychological distance from the event in the first place.

Although the current research focused only on the perceptions of a single individual (their *intrapersonal* experiences of time), it would also be fruitful to extend this work to examine the *interpersonal* consequences of time. Because subjective time is so elastic, two people could have very different perceptions of the subjective time of the same event. These diverging views can contribute to a lack of understanding or compassion for people still struggling with the trauma of a past event – to the experiencer, it feels like yesterday but to observers the trauma could seem quite remote, leading them to wonder why the traumatized person is not yet “over it.”

Diverging perceptions of subjective time could also be the cause of some interpersonal conflicts – and thus also offer the key to resolving those same problems. For instance, in Study 2, we asked the victim of an interpersonal transgression how close or far that transgression felt. It is easy to imagine that, had the *perpetrator* of that transgression been recounting their perception of subjective distance, the same event could be placed at an entirely different subjective distance.

Indeed, given that individuals have a propensity for keeping events that reflect poorly on themselves subjectively distant, versus more positive events (Ross & Wilson, 2003), it seems likely that even when someone recognizes their own bad behaviour, their perception of subjective distance could be quite dissimilar. Because humans share *objective* time, two individuals may assume they also share the same sense of *subjective* time, when they may in actuality differ vastly in their perceptions. A conflict that occurred one month earlier may feel like ancient history to one individual, and in turn its memory may lack emotional intensity, while to another individual the same event feels like yesterday, and its memory evokes the same strong emotions felt at the time of the event. Furthermore, both individuals may assume the other has a similar subjective experience, and thus can't understand why they have such dissimilar emotional outcomes. If, however, individuals understand how vastly the subjective experience of time can differ, attempts can be made to bridge this divide, and truly understand another's perspective. Future research should examine this possibility.

This same idea can be extended past the personal and interpersonal, and be applied to societal issues. Major historical events are also subject to wide variation in perceptions of subjective time. These differences have even been noted in the political arena repeatedly. Speaking about reparations for slavery, Senate Majority Leader Mitch McConnell argued that they were not necessary, stating, "I don't think reparations for something that happened 150 years ago for whom none of us currently living are responsible is a good idea." Author Ta-Nehisi Coates responded directly by saying, "That is the thing about Senator McConnell's 'something'. It was 150 years ago and it was right now" (Shen-Berro, 2019). Though both men acknowledge that slavery took place at the same point in time objectively, it is evident that it is subjectively

closer for Coates than for McConnell, and that the importance of this subjective closeness may be lost to McConnell.

Some research has examined the role that subjective time plays in the understanding of historical injustices, finding that among members of the perpetrator group, individuals who felt subjectively closer to the past injustice, versus those who felt far, were more willing to take action to make amends (Peetz, Gunn, & Wilson, 2010). However, no research as of yet has examined the relative importance of objective and subjective distance from these historic events, nor how the perpetrator and victimized groups may differ in their perceptions of subjective time from injustices, and how this may influence intergroup understanding as well as how they think about past injustice and present restitution more generally. This research could inspire new methods to bridge this political and perceptual gap.

Does time heal all wounds? Throughout our studies, in attempting to answer this question, we found evidence that while objective time can help, it is subjective time that does the heaviest lifting. This could have important implications in a wide variety of contexts, ranging from the personal and therapeutic, to interpersonal dynamics, and even to the broader political climate.

Works Cited

- Albrecht, S., & Carbon, C. C. (2014). The Fluency Amplification Model: Fluent stimuli show more intense but not evidently more positive evaluations. *Acta Psychologica, 148*, 195–203. <https://doi.org/10.1016/j.actpsy.2014.02.002>
- Alter, A. L., & Oppenheimer, D. M. (2008). Effects of fluency on psychological distance and mental construal (or why New York is a large city, but New York is a civilized jungle). *Psychological Science, 19*(2), 161–167. <https://doi.org/10.1111/j.1467-9280.2008.02062.x>
- Alter, A. L., & Oppenheimer, D. M. (2009). Uniting the tribes of fluency to form a metacognitive nation. *Personality and Social Psychology Review, 13*(3), 219-235. <https://doi.org/10.1177/1088868309341564>
- Ayduk, Ö., & Kross, E. (2010). From a distance: Implications of spontaneous self-distancing for adaptive self-reflection. *Journal of Personality and Social Psychology, 98*(5), 809–829. <https://doi.org/10.1037/a0019205>
- Berntsen, D., & Rubin, D. C. (2006). Emotion and vantage point in autobiographical. *Cognition and Emotion, 20*(8), 1193–1215. <https://doi.org/10.1080/02699930500371190>
- Brown, G. D. A., Neath, I., & Chater, N. (2007). A temporal ratio model of memory. *Psychological Review, 114*(3), 539–576. <https://doi.org/10.1037/0033-295X.114.3.539>
- Brown, N. R., Rips, L. J., & Shevell, S. K. (1985). The subjective dates of natural events in memory. *Cognitive Psychology, 17*(2), 139–177. [https://doi.org/10.1016/0010-0285\(85\)90006-4](https://doi.org/10.1016/0010-0285(85)90006-4)
- Cheung, I., & Olson, J. M. (2013). Sometimes it's easier to forgive my transgressor than your transgressor: Effects of subjective temporal distance on forgiveness for harm to self or close

other. *Journal of Applied Social Psychology*, 43(1), 195–200.

<https://doi.org/10.1111/j.1559-1816.2012.00997.x>

Cortes, K., Leith, S., & Wilson, A. E. (2018). Relationship satisfaction and the subjective distance of past relational events. *Journal of Social and Personal Relationships*, 35(8), 1092–1117. <https://doi.org/10.1177/0265407517704721>

Cortes, K., & Wilson, A. E. (2016). When slights beget slights: Attachment anxiety, subjective time, and intrusion of the relational past in the present. *Personality and Social Psychology Bulletin*, 42(12), 1693–1708. <https://doi.org/10.1177/0146167216670606>

D'Argembeau, A., & Van der Linden, M. (2004). Phenomenal characteristics associated with projecting oneself back into the past and forward into the future: Influence of valence and temporal distance. *Consciousness and Cognition*, 13(4), 844–858.

<https://doi.org/10.1016/j.concog.2004.07.007>

Davis, D., Shaver, P. R., & Vernon, M. L. (2003). Physical, emotional, and behavioral reactions to breaking up: The roles of gender, age, emotional involvement, and attachment style. *Personality and Social Psychology Bulletin*, 29(7), 871–884.

<https://doi.org/10.1177/0146167203252884>

Fraley, R. C., Heffernan, M. E., Vicary, A. M., & Brumbaugh, C. C. (2011). The experiences in close relationships—Relationship Structures Questionnaire: A method for assessing attachment orientations across relationships. *Psychological Assessment*, 23(3), 615–625.

<https://doi.org/10.1037/a0022898>

Gebauer, J. E., Haddock, G., Broemer, P., & von Hecker, U. (2013). The role of semantic self-perceptions in temporal distance perceptions toward autobiographical events: The semantic

- congruence model. *Journal of Personality and Social Psychology*, *105*(5), 852–872.
<https://doi.org/10.1037/a0033482>
- Greenberg, L. S. (2004). Emotion–focused therapy. *Clinical Psychology & Psychotherapy*, *11*(1), 3-16. <https://doi.org/10.1002/cpp.388>
- Gunn, G. R., & Wilson, A. E. (2007). Shifting perceptions of temporal distance from historical events to maintain social identity. Paper presented at the meeting of the Canadian Psychological Association, Ottawa, Canada.
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, *76*(4), 408–420.
<https://doi.org/10.1080/03637750903310360>
- Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling [White paper].
- Johnson, M. K., Foley, M. A., Suengas, A. G., & Raye, C. L. (1988). Phenomenal characteristics of memories for perceived and imagined autobiographical events. *Journal of Experimental Psychology: General*, *117*(4), 371–376. <https://doi.org/10.1037/0096-3445.117.4.371>
- Kelley, C. M., & Lindsay, D. S. (1993). Remembering mistaken for knowing: Ease of retrieval as a basis for confidence in answers to general knowledge questions. *Journal of Memory and Language*, *32*(1), 1-24. <https://doi.org/10.1006/jmla.1993.1001>
- Kenny, L. M., Bryant, R. A., Silove, D., Creamer, M., O’Donnell, M., & McFarlane, A. C. (2009). Distant memories: A prospective study of vantage point of trauma memories. *Psychological Science*, *20*(9), 1049–1052. <https://doi.org/10.1111/j.1467-9280.2009.02393.x>

- Kross, E., Ayduk, O., & Mischel, W. (2007). When asking “why” does not hurt: Distinguishing rumination from reflective processing of negative emotions. *Psychological Science, 16*(9), 709–715. <https://doi.org/10.1111/j.1467-9280.2005.01600.x>
- Libby, L. K., & Eibach, R. P. (2002). Looking back in time: Self-concept change affects visual perspective in autobiographical memory. *Journal of Personality and Social Psychology, 82*(2), 167–179. <https://doi.org/10.1037/0022-3514.82.2.167>
- Lindeman, M. I. H., Zengel, B., & Skowronski, J. J. (2017). An exploration of the relationship among valence, fading affect, rehearsal frequency, and memory vividness for past personal events. *Memory, 25*(6), 724–735. <https://doi.org/10.1080/09658211.2016.1210172>
- Ljungman, L., Hovén, E., Ljungman, G., Cernvall, M., & von Essen, L. (2015). Does time heal all wounds? A longitudinal study of the development of posttraumatic stress symptoms in parents of survivors of childhood cancer and bereaved parents. *Psycho-Oncology, 24*(12), 1792–1798. <https://doi.org/10.1002/pon.3856>
- Lucas, R. E. (2005). Time does not heal all wounds: A longitudinal study of reaction and adaptation to divorce. *Psychological Science, 16*(12), 945–950. <https://doi.org/10.1111/j.1467-9280.2005.01642.x>
- Lucas, R. E. (2007). Adaptation and the set-point model of subjective well-being. *Current Directions in Psychological Science, 16*(2), 75–79. <https://doi.org/10.1111/j.1467-8721.2007.00479.x>
- Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2003). Reexamining adaptation and the set point model of happiness: Reactions to changes in marital status. *Journal of Personality and Social Psychology, 84*(3), 527–539. <https://doi.org/10.1037/0022-3514.84.3.527>

- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7*(1), 83–104. <https://doi.org/10.1037/1082-989X.7.1.83>
- Marigold, D. C., Eibach, R. P., Libby, L. K., Ross, M., & Holmes, J. G. (2015). Framing memories of relationship transgressions: How visual imagery perspective activates relational knowledge. *Journal of Social and Personal Relationships, 32*(4), 491–508. <https://doi.org/10.1177/0265407514536304>
- McCullough, M. E., Fincham, F. D., & Tsang, J.-A. (2003). Forgiveness, forbearance, and time: The temporal unfolding of transgression-related interpersonal motivations. *Journal of Personality and Social Psychology, 84*(3), 540–557. <https://doi.org/10.1037/0022-3514.84.3.540>
- McIsaac, H. K., & Eich, E. (2002). Vantage point in episodic memory. *Psychonomic Bulletin and Review, 9*(1), 146–150. <https://doi.org/10.3758/BF03196271>
- Meade, A. W., & Craig, S. B. (2012). Identifying careless responses in survey data. *Psychological Methods, 17*(3), 437–455. <https://doi.org/10.1037/a0028085>
- Mrkva, K., Travers, M., & Van Boven, L. (2018). Simulational fluency reduces feelings of psychological distance. *Journal of Experimental Psychology: General, 147*(3), 354–376. <https://doi.org/10.1037/xge0000408>
- Neacsiu, A. D., Bohus, M., & Linehan, M. M. (2014). Dialectical behavior therapy: An intervention for emotion dysregulation. In J. J. Gross (Ed.), *Handbook of emotion regulation* (2nd ed., pp. 491-507). New York, NY: Guilford.
- Nigro, G., & Neisser, U. (1983). Point of view in personal memories. *Cognitive Psychology, 15*(4), 467–482. [https://doi.org/10.1016/0010-0285\(83\)90016-6](https://doi.org/10.1016/0010-0285(83)90016-6)

- Novemsky, N., Dhar, R., Schwarz, N., & Simonson, I. (2007). Preference fluency in choice. *Journal of Marketing Research*, 44(3), 347-356.
<https://doi.org/10.1509/jmkr.44.3.347>
- Peetz, J., Gunn, G. R., & Wilson, A. E. (2010). Crimes of the past: Defensive temporal distancing in the face of past in-group wrongdoing. *Personality & Social Psychology Bulletin*, 36(5), 598–611. <https://doi.org/10.1177/0146167210364850>
- Peetz, J., Wilson, A. E., & Strahan, E. J. (2009). So far away: The role of subjective temporal distance to future goals in motivation and behavior. *Social Cognition*, 27(4), 475–495.
<https://doi.org/10.1521/soco.2009.27.4.475>
- Reber, R., & Schwarz, N. (1999). Effects of perceptual fluency on judgments of truth. *Consciousness and Cognition*, 8(3), 338-342. <https://doi.org/10.1006/ccog.1999.0386>
- Reber, R., Winkielman, P., & Schwarz, N. (1998). Effects of perceptual fluency on affective judgments. *Psychological Science*, 9(1), 45–48. <https://doi.org/10.1111/1467-9280.00008>
- Ritchie, T. D., Skowronski, J. J., Wood, S. E., Walker, W. R., Vogl, R. J., & Gibbons, J. A. (2006). Event self-importance, event rehearsal, and the fading affect bias in autobiographical memory. *Self and Identity*, 5(2), 172–195.
<https://doi.org/10.1080/15298860600591222>
- Ross, M., & Wilson, A. E. (2002). It feels like yesterday: Self-esteem, valence of personal past experiences, and judgments of subjective distance. *Journal of Personality and Social Psychology*, 82(5), 792–803. <https://doi.org/10.1037/0022-3514.82.5.792>
- Ross, M., & Wilson, A. E. (2003). Autobiographical memory and conceptions of self. *Current Directions in Psychological Science*, 12(2), 66–69. <https://doi.org/10.1111/1467-8721.01228>

- Schwarz, N., & Clore, G. L. (2007). Feelings and phenomenal experiences. In A. Kruglanski & E. T. Higgins (Eds.), *Social psychology: Handbook of basic principles* (2nd ed., pp. 385-407). New York, NY: Guilford.
- Shen-Barro, J. (2019, June 19). Ta-Nehisi Coates calls out Mitch McConnell at House hearing on slavery reparations. *The Huffington Post*. Retrieved from <https://www.huffingtonpost.ca/>
- Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods*, 7(4), 422–445.
<https://doi.org/10.1037/1082-989X.7.4.422>
- Simmons, J. P., & Nelson, L. D. (2006). Intuitive confidence: Choosing between intuitive and nonintuitive alternatives. *Journal of Experimental Psychology: General*, 135(3), 409-428.
<http://dx.doi.org/10.1037/0096-3445.135.3.409>
- Skowronski, J. J., Walker, W. R., & Betz, A. L. (2003). Ordering our world: An examination of time in autobiographical memory. *Memory*, 11(3), 247–260.
<https://doi.org/10.1080/09658210244000009a>
- Skowronski, J. J., Walker, W. R., Henderson, D. X., & Bond, G. D. (2014). The Fading Affect Bias: Its history, its implications, and its future. *Advances in Experimental Social Psychology*, 49(1), 163–218. <https://doi.org/10.1016/B978-0-12-800052-6.00003-2>
- Sprecher, S., Felmlee, D., Metts, S., Fehr, B., & Vanni, D. (1998). Factors associated with distress following the breakup of a close relationship. *Journal of Social and Personal Relationships*, 15(6), 791–809. <https://doi.org/10.1177/0265407598156005>
- Trope, Y. & Liberman, N. (2010). Construal level theory of psychological distance. *Psychological Review*, 117(2), 440-463. <https://doi.org/10.1037/a0018963>

- Van Boven, L., & Caruso, E. M. (2015). The tripartite foundations of temporal psychological distance: Metaphors, ecology, and teleology. *Social and Personality Psychology Compass*, 9(11), 593–605. <https://doi.org/10.1111/spc3.12207>
- Van Boven, L., Kane, J., McGraw, A. P., & Dale, J. (2010). Feeling close: Emotional intensity reduces perceived psychological distance. *Journal of Personality and Social Psychology*, 98(6), 872–885. <https://doi.org/10.1037/a0019262>
- Van Boven, L., Loewenstein, G., Welch, E., & Dunning, D. (2012). The illusion of courage in self-predictions: Mispredicting one's own behavior in embarrassing situations. *Journal of Behavioral Decision Making*, 25(1), 1–12. <https://doi.org/10.1002/bdm.706>
- Wakimoto, R. (2011). Reconstruction of the subjective temporal distance of past interpersonal experiences after mortality salience. *Personality and Social Psychology Bulletin*, 37(5), 687–700. <https://doi.org/10.1177/0146167211400422>
- Walker, W. R., Skowronski, J. J., Gibbons, J. A., Vogl, R. J., & Ritchie, T. D. (2009). Why people rehearse their memories: Frequency of use and relations to the intensity of emotions associated with autobiographical memories. *Memory*, 17(7), 760–773. <https://doi.org/10.1080/09658210903107846>
- Walker, W. R., Vogl, R. J., & Thompson, C. P. (1997). Autobiographical memory: unpleasantness fades faster than pleasantness over time. *Applied Cognitive Psychology*, 11(5), 399–413. [https://doi.org/10.1002/\(SICI\)1099-0720\(199710\)11:5](https://doi.org/10.1002/(SICI)1099-0720(199710)11:5)
- Williams, L. E., Stein, R., & Galguera, L. (2013). The distinct affective consequences of psychological distance and construal level. *Journal of Consumer Research*, 40(6), 1123–1138. <https://doi.org/10.1086/674212>

- Wilson, A. E., Gunn, G. R., & Ross, M. (2009). The role of subjective time in identity regulation. *Applied Cognitive Psychology, 23*(8), 1164–1178.
<https://doi.org/10.1002/acp.1617>
- Wilson, A.E., & Ross, M. (2003). The identity function of autobiographical memory: Time is on our side. *Memory, 11*(2), 137–149. <https://doi.org/10.1080/741938210>
- Winkielman, P., & Cacioppo, J.T. (2001). Mind at ease puts a smile on the face: Psychophysiological evidence that processing facilitation leads to positive affect. *Journal of Personality and Social Psychology, 81*(6), 989–1000. <https://doi.org/10.1037/0022-3514.81.6.989>
- Wohl, M. J. A., & McGrath, A. L. (2007). The perception of time heals all wounds: Temporal distance affects willingness to forgive following an interpersonal transgression. *Personality and Social Psychology Bulletin, 33*(7), 1023–1035.
<https://doi.org/10.1177/0146167207301021>

Tables and Figures

Table 1.

Study 1A: Means, Standard Deviations, and Zero-Order Correlations with Subjective Distance

Variable	Mean	SD	Correlation with Subjective Distance	p
Subjective Distance	66.38	30.07	---	---
Days Since Breakup: Overall	880.29	1059.35	.19*	.037
Days Since Breakup: First Breakup	1290.62	1353.07	.22	.103
Days Since Breakup: Most Recent Breakup	510.33	457.92	.18	.172
Past Negative Affect	4.83	1.78	-.21*	.016
Past Importance	5.29	1.62	-.12	.201
Present Negative Affect	2.71	1.14	-.50***	< .001
Present Importance	3.37	2.18	-.25**	.006
Future Negative Affect	2.38	.84	-.26**	.003
Future Importance	2.75	2.23	-.18*	.046
Person Judgment	3.46	1.65	-.14	.130
Relative Negativity of Event	4.66	1.86	-.43***	< .001
Frequency of Thought	2.47	1.59	-.63***	< .001
Perspective Taken ^a	2.85	1.36	.04	.643
Immersed or Distanced Observer ^b	2.96	1.83	.19*	.031
Emotions During Study	2.74	1.53	-.54***	< .001
Recall Ease	4.91	1.70	-.29**	.001

^a Higher score indicates third person (rather than first person) perspective

^b Higher score indicates feeling like a distanced (rather than immersed) observer

Table 2.

Study 1A: Regression Analysis of Objective and Subjective Time on Reactions to Past Breakup

Dependent Variable	Objective Time (Step 1)				Subjective Time (Step 2)			
	β	p	95% CI	R ²	β	p	95% CI	R ² Change
Past Negative Affect	.07	.437	[-.19, .45]	.01	-.22	.017	[-.02, -.003]	.05*
Past Importance	-.02	.803	[-.33, .26]	.001	-.11	.216	[-.02, .004]	.01
Present Negative Affect	-.04	.685	[-.25, .16]	.001	-.50	< .001	[-.03, -.01]	.25***
Present Importance	-.23	.010	[-.87, -.12]	.05*	-.24	.006	[-.03, -.01]	.06**
Future Negative Affect	.03	.780	[-.13, .17]	.001	-.28	.002	[-.01, -.003]	.08**
Future Importance	-.08	.408	[-.56, .23]	.01	-.19	.036	[-.03, -.001]	.05*
Person Judgment	-.09	.300	[-.45, .14]	.01	-.11	.220	[-.02, .004]	.01
Relative Negativity of Event	.03	.770	[-.28, .38]	.001	-.43	< .001	[-.04, -.02]	.18***
Frequency of Thought	-.16	.080	[-.53, .03]	.03 [†]	-.62	< .001	[-.04, -.03]	.39***
Perspective Taken ^a	-.01	.906	[-.26, .23]	< .001	.04	.701	[-.01, .01]	.001
Immersed or Distanced Observer ^b	.05	.574	[-.23, .42]	.003	.21	.020	[.002, .02]	.04*
Emotions During Study	-.03	.737	[-.32, .23]	.001	-.54	< .001	[-.04, -.02]	.29***
Recall Ease	-.12	.197	[-.50, .10]	.01	-.30	.001	[-.03, -.01]	.09**

^a Higher score indicates third person (rather than first person) perspective

^b Higher score indicates feeling like a distanced (rather than immersed) observer

Table 3.

Study 1A: Regression Analysis of Objective and Subjective Time on Reactions to First Breakup

Dependent Variable	Objective Time (Step 1)				Subjective Time (Step 2)			
	β	p	95% CI	R ²	β	p	95% CI	R ² Change
Past Negative Affect	-.08	.563	[-.0004, .0002]	.01	-.41	.003	[-.04, -.01]	.16
Past Importance	.01	.952	[-.0003, .0004]	.0001	-.09	.515	[-.02, .01]	.01
Present Negative Affect	-.07	.609	[-.0003, .0002]	.01	-.46	.001	[-.03, -.01]	.20
Present Importance	-.10	.465	[-.001, .0003]	.01	-.24	.094	[-.04, .003]	.06
Future Negative Affect	-.06	.648	[-.0002, .0001]	.004	-.39	.005	[-.02, -.004]	.15
Future Importance	-.06	.697	[-.001, .0004]	.003	-.10	.500	[-.03, .02]	.01
Person Judgment	-.09	.518	[-.0004, .0002]	.01	-.28	.046	[-.03, -.0002]	.08
Relative Negativity of Event	-.09	.521	[-.001, .0003]	.01	-.57	< .001	[-.06, -.02]	.31
Frequency of Thought	-.18	.205	[-.0005, .0001]	.03	-.69	< .001	[-.05, -.03]	.46
Perspective Taken ^a	-.19	.173	[-.0005, .0001]	.04	-.10	.485	[-.02, .01]	.01
Immersed or Distanced Observer ^b	.31	.026	[.0001, .001]	.09	.20	.143	[-.01, .03]	.04
Emotions During Study	-.30	.031	[-.001, -.00003]	.09	-.52	< .001	[-.04, -.02]	.26
Recall Ease	-.17	.222	[-.001, .0001]	.03	-.17	.232	[-.03, .01]	.03

^a Higher score indicates third person (rather than first person) perspective

^b Higher score indicates feeling like a distanced (rather than immersed) observer

Table 4.

Study 1A: Regression Analysis of Objective and Subjective Time on Reactions to Most Recent Breakup

Dependent Variable	Objective Time (Step 1)				Subjective Time (Step 2)			
	β	p	95% CI	R ²	β	p	95% CI	R ² Change
Past Negative Affect	-.15	.249	[-.002, .0004]	.02	-.09	.506	[-.02, .01]	.01
Past Importance	-.12	.347	[-.001, .0005]	.02	-.09	.518	[-.01, .01]	.01
Present Negative Affect	-.23	.076	[-.001, .00007]	.05	-.55	< .001	[-.03, -.01]	.29
Present Importance	.09	.474	[-.001, .002]	.01	-.30	.024	[-.04, -.003]	.09
Future Negative Affect	-.20	.124	[-.001, .0001]	.04	-.17	.100	[-.01, .001]	.05
Future Importance	-.09	.512	[-.002, .001]	.01	-.29	.029	[-.04, -.002]	.08
Person Judgment	.14	.285	[-.0004, .001]	.02	.07	.587	[-.01, .02]	.01
Relative Negativity of Event	-.12	.371	[-.002, .001]	.01	-.27	.043	[-.03, .0005]	.07
Frequency of Thought	-.33	.009	[-.002, -.0003]	.11	-.54	< .001	[-.04, -.02]	.28
Perspective Taken ^a	.10	.429	[-.0004, .001]	.01	-.09	.500	[-.01, .01]	.01
Immersed or Distanced Observer ^b	.31	.017	[.0002, .002]	.09	.12	.344	[-.01, .02]	.01
Emotions During Study	-.43	.001	[-.002, -.001]	.18	-.42	< .001	[-.03, -.01]	.18
Recall Ease	-.02	.912	[-.001, .001]	.0002	-.31	.019	[-.03, -.003]	.09

^a Higher score indicates third person (rather than first person) perspective

^b Higher score indicates feeling like a distanced (rather than immersed) observer

Table 5.

Study 1B: Means, Standard Deviations, and Zero-Order Correlations with Subjective Distance

Variable	Mean	SD	Correlation with Subjective Distance	p
Subjective Distance	66.53	24.06	---	---
Days Since Birthday: Overall	663.25	498.17	.30***	< .001
Days Since Birthday: Three Years Ago	1114.49	205.35	-.01	.915
Days Since Birthday: Most Recent	174.01	96.69	.19 [†]	.063
Past Positive Affect	4.80	.72	-.08	.273
Past Importance	4.65	1.69	-.29***	< .001
Present Positive Affect	4.55	.72	-.24**	.001
Present Importance	3.71	1.87	-.36***	< .001
Future Positive Affect	4.47	3.54	-.24**	.001
Future Importance	3.54	1.86	-.27***	< .001
Relative Positivity of Event	3.65	1.24	.37***	< .001
Frequency of Thought	2.35	1.60	-.54***	< .001
Perspective Taken ^a	3.07	1.64	-.03	.681
Immersed or Distanced Observer ^b	3.02	1.73	.15*	.031
Emotions During Study	3.53	1.49	-.37***	< .001
Recall Ease	4.30	2.07	-.43***	< .001

^a Higher score indicates third person (rather than first person) perspective

^b Higher score indicates feeling like a distanced (rather than immersed) observer

Table 6.

Study 1B: Regression Analysis of Objective and Subjective Time on Reactions to Past Birthday

Dependent Variable	Objective Time (Step 1)				Subjective Time (Step 2)			
	β	p	95% CI	R ²	β	p	95% CI	R ² Change
Past Positive Affect	-.08	.243	[-.16, .04]	.01	-.06	.456	[-.01, .003]	.003
Past Importance	-.06	.401	[-.34, .14]	.004	-.30	< .001	[-.03, -.01]	.08***
Present Positive Affect	-.10	.180	[-.17, .03]	.01	-.26	.001	[-.12, -.003]	.06**
Present Importance	-.19	.009	[-.60, -.09]	.04**	-.35	< .001	[-.04, -.02]	.11***
Future Positive Affect	-.18	.012	[-.24, -.03]	.03*	-.21	.004	[-.01, -.002]	.04**
Future Importance	-.21	.003	[-.65, -.14]	.05**	-.22	.002	[-.03, -.01]	.05**
Relative Positivity of Event	-.39	< .001	[-.64, -.32]	.15***	-.29	< .001	[-.02, -.01]	.07***
Frequency of Thought	-.21	.004	[-.55, -.11]	.04**	-.53	< .001	[-.04, -.03]	.25***
Perspective Taken ^a	-.02	.815	[-.26, .21]	< .001	-.02	.771	[-.01, .01]	< .001
Immersed or Distanced Observer ^b	.13	.078	[-.02, .45]	.02 [†]	.15	.043	[.0003, .02]	.02*
Emotions During Study	-.14	.050	[-.42, -.003]	.02*	-.37	< .001	[-.03, -.01]	.12***
Recall Ease	-.39	< .001	[-1.08, -.54]	.16***	-.34	< .001	[-.04, -.02]	.11***

^a Higher score indicates third person (rather than first person) perspective

^b Higher score indicates feeling like a distanced (rather than immersed) observer

Table 7.

Study 1B: Regression Analysis of Objective and Subjective Time on Reactions to Three Birthdays Ago

Dependent Variable	Objective Time (Step 1)				Subjective Time (Step 2)			
	β	p	95% CI	R ²	β	p	95% CI	R ² Change
Past Positive Affect	-.05	.658	[-.001, .001]	.002	-.07	.485	[-.01, .01]	.01
Past Importance	.06	.531	[-.001, .002]	.004	-.39	< .001	[-.05, -.02]	.15
Present Positive Affect	.07	.465	[-.0004, .001]	.01	-.17	.092	[-.01, .001]	.03
Present Importance	.04	.724	[-.001, .002]	.001	-.48	< .001	[-.05, -.03]	.23
Future Positive Affect	.04	.673	[-.001, .001]	.002	-.21	.032	[-.02, -.001]	.05
Future Importance	.05	.601	[-.001, .002]	.003	-.23	.024	[-.04, -.002]	.05
Relative Positivity of Event	.11	.277	[-.0005, .002]	.01	.26	.010	[.003, .02]	.07
Frequency of Thought	.01	.964	[-.001, .001]	.00002	-.49	< .001	[-.05, -.02]	.24
Perspective Taken ^a	-.20	.049	[-.003, -.00001]	.04	-.05	.599	[-.02, .01]	.003
Immersed or Distanced Observer ^b	-.19	.061	[-.003, .0001]	.04	.22	.026	[.002, .03]	.05
Emotions During Study	-.02	.883	[-.002, .001]	.0002	-.31	.002	[-.04, -.01]	.09
Recall Ease	.13	.181	[-.001, .003]	.02	-.41	< .001	[-.06, -.02]	.17

^a Higher score indicates third person (rather than first person) perspective

^b Higher score indicates feeling like a distanced (rather than immersed) observer

Table 8.

Study 1B: Regression Analysis of Objective and Subjective Time on Reactions to Most Recent Birthday

Dependent Variable	Objective Time (Step 1)				Subjective Time (Step 2)			
	β	p	95% CI	R ²	β	p	95% CI	R ² Change
Past Positive Affect	-.003	.980	[-.001, .001]	.00001	-.04	.708	[-.01, .01]	.002
Past Importance	-.10	.317	[-.01, .002]	.01	-.17	.106	[-.03, .002]	.03
Present Positive Affect	-.08	.427	[-.002, .001]	.01	-.31	.003	[-.02, -.003]	.09
Present Importance	.13	.181	[-.001, .003]	.002	-.41	< .001	[-.06, -.02]	.05
Future Positive Affect	-.04	.702	[-.002, .001]	.002	-.20	.054	[-.01, .0001]	.04
Future Importance	-.06	.582	[-.01, .003]	.003	-.21	.052	[-.03, .0001]	.04
Relative Positivity of Event	.14	.187	[-.001, .004]	.02	.32	.002	[.01, .03]	.10
Frequency of Thought	-.16	.119	[-.01, .001]	.03	-.52	< .001	[-.05, -.02]	.26
Perspective Taken ^a	-.10	.328	[-.01, .002]	.01	.02	.837	[-.01, .02]	.0005
Immersed or Distanced Observer ^b	-.01	.935	[-.004, .003]	.0001	.07	.535	[-.01, .02]	.004
Emotions During Study	-.10	.351	[-.01, .002]	.01	-.39	< .001	[-.04, -.01]	.15
Recall Ease	-.24	.022	[-.01, -.001]	.06	-.26	.011	[-.03, -.004]	.07

^a Higher score indicates third person (rather than first person) perspective

^b Higher score indicates feeling like a distanced (rather than immersed) observer

Table 9.

Study 2: Means, Standard Deviations, and Zero-Order Correlations with Subjective Distance

Variable	Mean	SD	Correlation with Subjective Distance	p
Subjective Distance	56.05	32.26	---	---
Days Since Transgression: Overall	487.28	787.64	.27***	< .001
Days Since Transgression: One Year Ago	953.38	898.81	.10	.357
Days Since Transgression: One Month Ago	21.18	18.87	.37***	<.001
Past Affect	5.84	1.21	-.08	.271
Past Importance	5.80	1.44	-.05	.497
Present Affect	2.97	1.79	-.50***	< .001
Present Importance	3.16	2.02	-.47***	< .001
Future Affect	2.26	1.63	-.41***	< .001
Future Importance	2.37	1.77	-.40***	< .001
Person Judgment	2.26	1.33	-.32***	< .001
Act Judgment	4.80	1.41	-.16*	.024
Relational Reactions	2.81	1.38	-.41***	< .001
Inability of Other to Change	3.17	1.46	-.28***	< .001
Likelihood of Repeating Behavior	4.01	1.93	-.43***	< .001
Closeness Before Act ^a	5.84	1.32	-.04	.621
Closeness Post-Act ^a	3.64	1.68	.14†	.055
Closeness At Present ^a	5.67	1.67	.36***	< .001
Frequency of Thought	2.83	1.84	-.55***	< .001
Frequency of Mentions	2.34	1.61	-.28***	< .001
Recall Ease	5.46	1.63	-.39***	< .001

^a Higher score indicates greater closeness

Table 10.

Study 2: Regression Analysis of Objective and Subjective Time on Reactions to Past Interpersonal Transgression

Dependent Variable	Objective Time (Step 1)				Subjective Time (Step 2)			
	β	p	95% CI	R ²	β	p	95% CI	R ² Change
Past Affect	.23	.002	[.10, .45]	.05**	-.16	.047	[-.01, .000]	.02*
Past Importance	.21	.004	[.10, .52]	.05**	-.10	.204	[-.01, .002]	.01
Present Affect	-.09	.208	[-.41, .09]	.01	-.52	< .001	[-.04, -.02]	.23***
Present Importance	-.09	.222	[-.48, .11]	.01	-.50	< .001	[-.04, -.02]	.21***
Future Affect	.06	.415	[-.14, .33]	.004	-.48	< .001	[-.03, -.02]	.20***
Future Importance	.07	.337	[-.13, .39]	.01	-.48	< .001	[-.03, -.02]	.20***
Person Judgment	.11	.144	[-.05, .33]	.01	-.43	< .001	[-.02, -.01]	.16***
Act Judgment	.14	.057	[-.01, .39]	.02 [†]	-.26	.001	[-.02, -.004]	.06**
Relational Reactions	.10	.174	[-.06, .34]	.01	-.50	< .001	[-.03, -.02]	.22***
Inability of Other to Change	-.04	.623	[-.26, .16]	.001	-.30	< .001	[-.02, -.01]	.08***
Likelihood of Repeating Behavior	-.33	< .001	[-.90, -.37]	.11***	-.36	< .001	[-.03, -.01]	.11***
Closeness Before Act ^a	-.09	.253	[-.30, .08]	.01	-.02	.769	[-.01, .01]	.000
Closeness Post-Act ^a	-.18	.015	[-.55, -.06]	.03*	.21	.007	[.003, .02]	.04**
Closeness At Present ^a	.03	.683	[-.19, .29]	.001	.41	< .001	[.01, .03]	.14***
Frequency of Thought	.02	.839	[-.24, .30]	.000	-.62	< .001	[-.04, -.03]	.33***
Frequency of Mentions	.03	.709	[-.19, .28]	.001	-.32	< .001	[-.02, -.01]	.09***
Recall Ease	-.01	.857	[-.27, .22]	.000	-.44	< .001	[-.03, -.02]	.17***

^a Higher score indicates greater closeness

Table 11.

Study 2: Regression Analysis of Objective and Subjective Time on Reactions to Older Interpersonal Transgression

Dependent Variable	Objective Time (Step 1)				Subjective Time (Step 2)			
	β	p	95% CI	R ²	β	p	95% CI	R ² Change
Past Affect	.15	.140	[-.00003, .0002]	.02	-.23	.025	[-.02, -.001]	.05
Past Importance	-.06	.579	[-.0001, .0001]	.003	-.22	.031	[-.02, -.001]	.05
Present Affect	-.16	.130	[-.0003, .00004]	.02	-.55	< .001	[-.04, -.02]	.30
Present Importance	-.11	.280	[-.0003, .0001]	.01	-.47	< .001	[-.05, -.03]	.28
Future Affect	-.09	.393	[-.0002, .0001]	.01	-.59	< .001	[-.04, -.02]	.34
Future Importance	-.03	.740	[-.0002, .0001]	.001	-.57	< .001	[-.05, -.02]	.32
Person Judgment	-.12	.254	[-.0002, .0001]	.01	-.47	< .001	[-.03, -.01]	.22
Act Judgment	-.04	.671	[-.0002, .0001]	.002	-.16	.124	[-.01, .002]	.03
Relational Reactions	-.08	.447	[-.0002, .0001]	.01	-.46	< .001	[-.03, -.01]	.21
Inability of Other to Change	-.11	.296	[-.0002, .0001]	.01	-.30	.003	[-.03, -.01]	.09
Likelihood of Repeating Behavior	-.25	.013	[-.0004, -.0001]	.06	-.39	< .001	[-.04, -.01]	.15
Closeness Before Act ^a	-.03	.785	[-.0002, .0001]	.001	-.13	.212	[-.02, .003]	.02
Closeness Post-Act ^a	-.10	.325	[-.0002, .0001]	.01	.03	.808	[-.01, .01]	.001
Closeness At Present ^a	.03	.783	[-.0001, .0002]	.001	.38	< .001	[.01, .03]	.14
Frequency of Thought	-.16	.114	[-.0003, .00003]	.03	-.63	< .001	[-.05, -.03]	.39
Frequency of Mentions	-.10	.314	[-.0002, .0001]	.01	-.37	< .001	[-.03, -.01]	.14
Recall Ease	-.03	.771	[-.0002, .0001]	.001	-.32	.002	[-.03, -.01]	.10

^a Higher score indicates greater closeness

Table 12.

Study 2: Regression Analysis of Objective and Subjective Time on Reactions to Newer Interpersonal Transgression

Dependent Variable	Objective Time (Step 1)				Subjective Time (Step 2)			
	β	p	95% CI	R ²	β	p	95% CI	R ² Change
Past Affect	-.05	.660	[-.01, .01]	.002	-.11	.345	[-.01, .01]	.01
Past Importance	-.01	.918	[-.01, .01]	.0001	-.06	.589	[-.02, .01]	.003
Present Affect	-.33	.002	[-.04, -.01]	.11	-.39	< .001	[-.03, -.01]	.13
Present Importance	-.24	.023	[-.04, -.003]	.06	-.42	< .001	[-.04, -.02]	.16
Future Affect	-.23	.027	[-.03, -.002]	.05	-.32	.003	[-.03, -.01]	.09
Future Importance	-.12	.240	[-.02, .01]	.02	-.37	.001	[-.03, -.01]	.12
Person Judgment	-.28	.008	[-.03, -.004]	.08	-.31	.004	[-.02, -.004]	.08
Act Judgment	-.02	.878	[-.01, .01]	.0003	-.31	.005	[-.02, -.004]	.09
Relational Reactions	-.21	.044	[-.02, -.0003]	.04	-.50	< .001	[-.03, -.01]	.22
Inability of Other to Change	-.22	.035	[-.02, -.001]	.05	-.25	.023	[-.02, -.002]	.05
Likelihood of Repeating Behavior	-.28	.007	[-.03, -.01]	.08	-.27	.011	[-.03, -.004]	.07
Closeness Before Act ^a	-.02	.842	[-.01, .01]	.0004	.13	.244	[-.004, .01]	.02
Closeness Post-Act ^a	.09	.418	[-.01, .02]	.01	.33	.003	[.01, .03]	.10
Closeness At Present ^a	.16	.133	[-.003, .02]	.03	.36	.001	[.01, .03]	.11
Frequency of Thought	-.30	.004	[-.04, -.01]	.09	-.49	< .001	[-.04, -.02]	.21
Frequency of Mentions	-.22	.033	[-.03, -.001]	.05	-.20	.063	[-.02, .001]	.04
Recall Ease	-.04	.739	[-.02, .01]	.001	-.52	< .001	[-.04, -.02]	.23

^a Higher score indicates greater closeness

Table 13.

Study 2: Correlations Between Anxious and Avoidant Attachment, and Dependent Variables, Controlling for Objective Time

Condition

	Avoidant Attachment		Anxious Attachment	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>p</i>
Past Affect	-.01	.903	-.09	.224
Past Importance	.08	.297	-.002	.978
Present Affect	-.34	< .001	-.28	< .001
Present Importance	-.25	< .001	-.17	.022
Future Affect	-.24	.001	-.08	.287
Future Importance	-.22	.002	-.06	.456
Person Judgment	-.58	< .001	-.44	< .001
Act Judgment	-.17	.022	-.20	.005
Relational Reactions	-.61	< .001	-.41	< .001
Inability of Other to Change	-.36	< .001	-.20	.007
Likelihood of Repeating Behavior	-.34	< .001	-.35	< .001
Closeness Before Act ^a	.38	< .001	.15	.046
Closeness Post-Act ^a	.26	< .001	.30	< .001
Closeness At Present ^a	.64	< .001	.44	< .001
Frequency of Thought	-.34	< .001	-.31	< .001
Frequency of Mentions	-.11	.137	-.12	.106
Recall Ease	-.06	.410	-.08	.274

^a Higher score indicates greater closeness

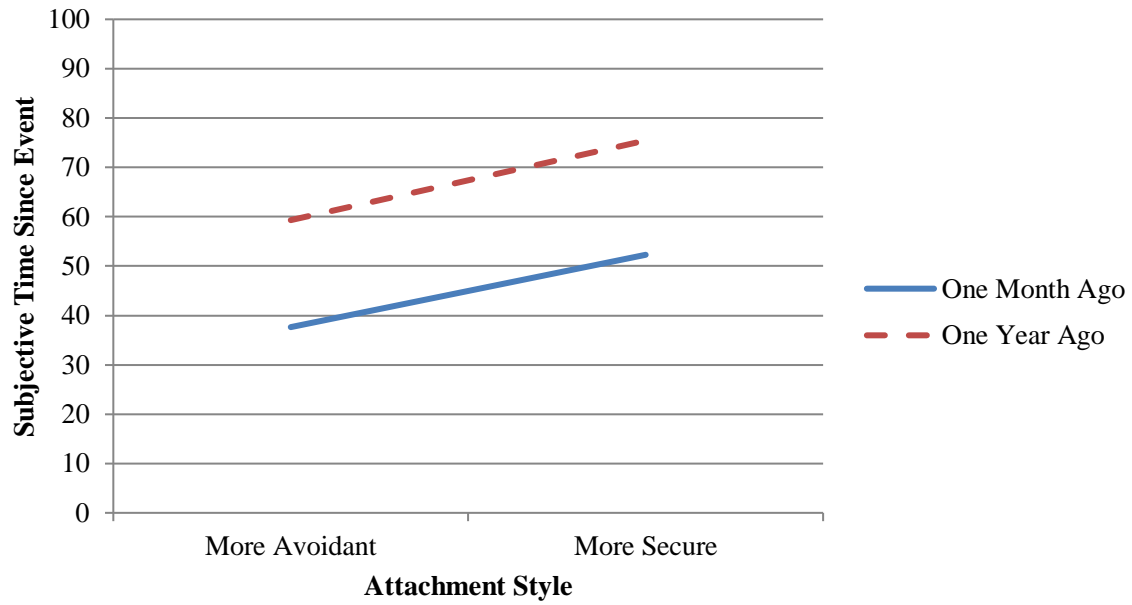


Figure 1. Study 2 regression of avoidant attachment style X objective time condition interaction on subjective time perceptions.

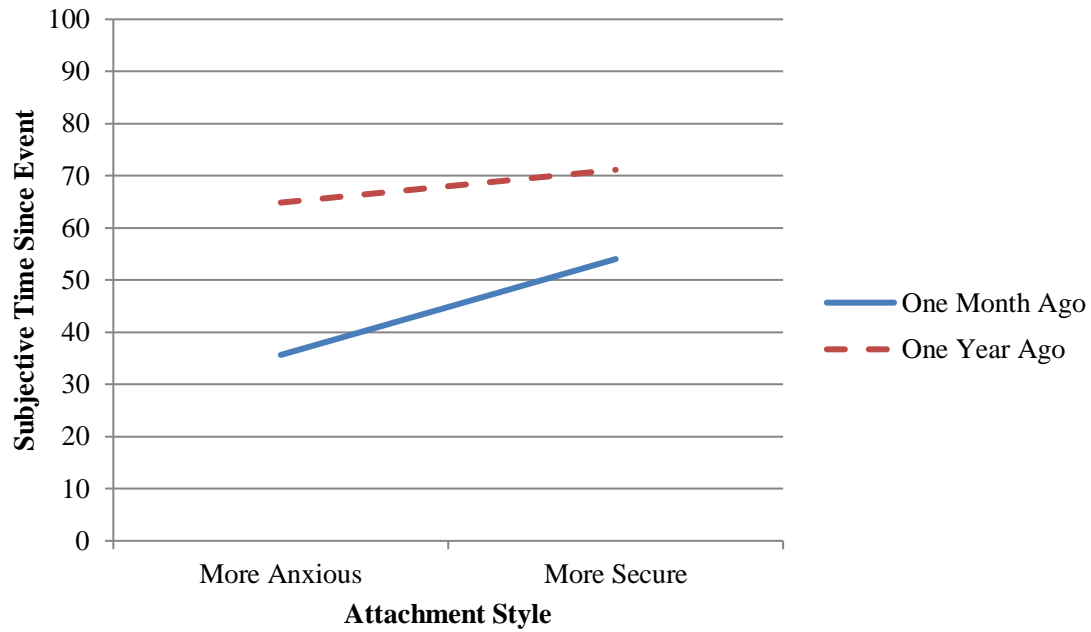


Figure 2. Study 2 regression of anxious attachment style X objective time condition interaction on subjective time perceptions.

Table 14.

Study 2: Path Coefficients for Avoidant Attachment Mediation Estimated Using PROCESS (Model 4)

Dependent Variable	a	b	c Direct	c' Total	Indirect Effect	95% CI
Past Negative Affect	8.25*** (2.27)	-.01** (.003)	.05 (.09)	-.01 (.10)	-.06 (.03)	[-.13, -.02]
Past Importance	8.19*** (2.29)	-.01** (.003)	.18 (.11)	.12 (.11)	-.07 (.04)	[-.16, -.02]
*Present Negative Affect ^b	8.25*** (2.27)	-.03*** (.004)	-.51*** (.12)	-.66*** (.13)	-.22 (.06)	[-.37, -.11]
*Present Importance ^b	7.97*** (2.32)	-.03*** (.004)	-.32* (.14)	-.57*** (.16)	-.25 (.08)	[-.41, -.10]
*Future Negative Affect ^b	8.25*** (2.27)	-.02*** (.003)	-.29* (.11)	-.43** (.13)	-.20 (.05)	[-.32, -.10]
*Future Importance ^b	9.00*** (2.28)	-.03*** (.004)	-.23† (.13)	-.43** (.14)	-.23 (.06)	[-.39, -.13]
*Person Judgment ^b	8.25*** (2.27)	-.01*** (.003)	-.77*** (.08)	-.83*** (.09)	-.10 (.03)	[-.16, -.05]
*Act Judgment ^b	8.25*** (2.27)	-.01** (.003)	-.13 (.11)	-.25* (.11)	-.07 (.04)	[-.16, -.01]
*Relational Reactions ^b	8.25*** (2.27)	-.02*** (.002)	-.81*** (.08)	-.93*** (.09)	-.13 (.04)	[-.23, -.07]
*Inability of Other to Change ^b	8.25*** (2.27)	-.01** (.003)	-.51*** (.11)	-.57*** (.11)	-.09 (.04)	[-.18, -.03]
*Likelihood of Repeating Behavior ^b	8.03*** (2.29)	-.02*** (.004)	-.51*** (.13)	-.67*** (.14)	-.14 (.05)	[-.25, -.06]
Closeness Before Act ^a	8.25*** (2.27)	-.005 (.003)	.62*** (.10)	.55*** (.10)	-.04 (.03)	[-.10, .005]
*Closeness Post-Act ^{a b}	8.25*** (2.27)	.01* (.004)	.42** (.13)	.47*** (.13)	.06 (.04)	[.01, .16]
*Closeness At Present ^{a b}	8.25*** (2.27)	.01*** (.003)	1.08*** (.10)	1.15*** (.10)	.10 (.04)	[.04, .19]
*Frequency of Thought ^b	8.25*** (2.27)	-.03*** (.004)	-.45*** (.11)	-.68*** (.14)	-.27 (.08)	[-.43, -.13]
*Frequency of Mentions ^b	8.25*** (2.27)	-.02*** (.004)	-.10 (.12)	-.20 (.13)	-.13 (.05)	[-.24, .06]
Recall Ease	8.25*** (2.27)	-.02*** (.004)	.08 (.12)	-.11 (.13)	-.18 (.06)	[-.32, -.08]

^a Higher score indicates greater closeness

^b Indicates dependent variables which, when mediation is reversed (DV becomes mediator and vice versa), result in a significant mediation

Table 15.

Study 2: Path Coefficients for Anxious Attachment Mediation Estimated Using PROCESS (Model 4)

Dependent Variable	a	b	c Direct	c' Total	Indirect Effect	95% CI
Past Negative Affect	4.78** (1.63)	-.01* (.003)	-.05 (.06)	-.08 (.07)	-.03 (.02)	[-.08, -.01]
Past Importance	4.74** (1.64)	-.01* (.003)	.01 (.07)	-.002 (.08)	-.04 (.02)	[-.10, -.004]
*Present Negative Affect ^b	4.78** (1.63)	-.03*** (.003)	-.29*** (.08)	-.38*** (.10)	-.13 (.05)	[-.45, -.05]
*Present Importance ^b	4.79** (1.66)	-.03*** (.004)	-.12 (.10)	-.27* (.12)	-.16 (.06)	[-.29, -.05]
Future Negative Affect	4.78** (1.63)	-.03*** (.003)	-.01 (.08)	-.10 (.09)	-.12 (.05)	[-.23, -.04]
Future Importance	4.71** (1.62)	-.03*** (.004)	.04 (.09)	-.08 (.10)	-.13 (.05)	[-.24, -.04]
*Person Judgment ^b	4.78** (1.63)	-.01*** (.003)	-.44*** (.06)	-.45*** (.07)	-.07 (.03)	[-.12, -.02]
*Act Judgment ^b	4.78** (1.63)	-.01** (.003)	-.14† (.08)	-.22** (.08)	-.04 (.02)	[-.10, -.01]
*Relational Reactions ^b	4.78** (1.63)	-.02*** (.003)	-.37*** (.06)	-.44*** (.07)	-.09 (.04)	[-.17, -.02]
*Inability of Other to Change ^b	4.78** (1.63)	-.01*** (.003)	-.20** (.08)	-.22** (.08)	-.06 (.03)	[-.13, -.02]
Likelihood of Repeating Behavior	4.84** (1.67)	-.02*** (.004)	-.42*** (.09)	-.50*** (.10)	-.09 (.04)	[-.18, -.02]
Closeness Before Act ^a	4.78** (1.63)	-.002 (.003)	.21** (.07)	.15* (.07)	-.01 (.02)	[-.05, .02]
*Closeness Post-Act ^{a b}	4.78** (1.63)	.01* (.004)	.35*** (.09)	.40*** (.09)	.04 (.02)	[.002, .11]
*Closeness At Present ^{a b}	4.78** (1.63)	.02*** (.003)	.55*** (.08)	.56*** (.08)	.07 (.03)	[.02, .15]
*Frequency of Thought ^b	4.78** (1.63)	-.03*** (.004)	-.30*** (.08)	-.44*** (.10)	-.16 (.06)	[-.30, -.05]
*Frequency of Mentions ^b	4.78** (1.63)	-.02*** (.004)	-.09 (.09)	-.15 (.09)	-.08 (.03)	[-.16, -.02]
Recall Ease	4.78** (1.63)	-.02*** (.004)	.003 (.08)	-.10 (.09)	-.10 (.04)	[-.19, -.04]

^a Higher score indicates greater closeness

^b Indicates dependent variables which, when mediation is reversed (DV becomes mediator and vice versa), result in a significant mediation

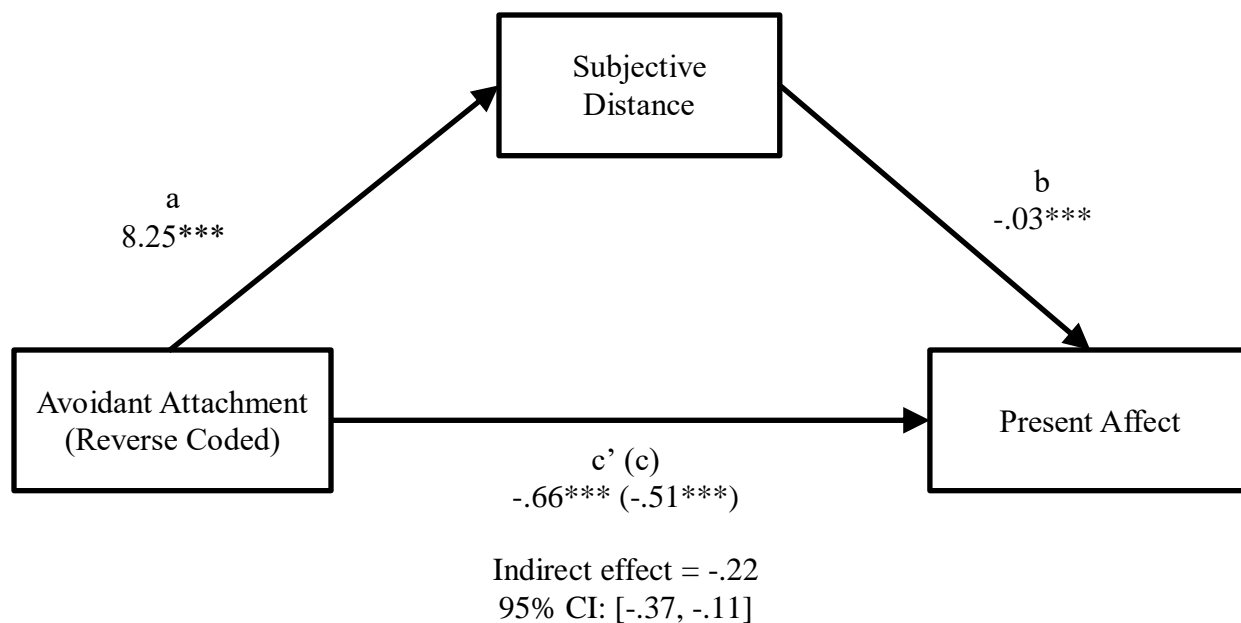


Figure 3. Sample diagram for Study 2 mediation model, using avoidant attachment as independent variable, and present affect as outcome variable. (Model 1: avoidant attachment (reverse coded) [X] → subjective distance from event [M] → all dependent variables [Y1-Y17]; Model 2: anxious attachment (reverse coded) [X] → subjective distance from event [M] → all dependent variables [Y1-Y17]).

Table 16.

Study 3: Means, Standard Deviations, and Zero-Order Correlations with Subjective Distance

Variable	Mean	SD	Correlation with Subjective Distance (Overall)	p
Subjective Distance: Overall	32.43	27.19	---	---
Subjective Distance: Far	39.19	27.25	---	---
Subjective Distance: Close	24.87	25.18	---	---
Days Since Failure: Overall	180.53	191.45	.10	.166
Days Since Failure: One Year Ago	358.04	149.47	-.03	.773
Days Since Failure: One Month Ago	33.20	23.06	.24*	.015
Past Negative Affect	5.83	1.28	-.14†	.058
Past Importance	6.02	1.44	-.13†	.080
Present Negative Affect	4.20	1.58	-.55***	< .001
Present Importance	4.50	1.95	-.48***	< .001
Future Negative Affect	2.69	1.53	-.40***	< .001
Future Importance	2.99	1.98	-.30***	< .001
Recall Ease	6.16	1.13	-.20**	.008
Recall Perspective ^a	2.84	1.66	.06	.408
Recall Immersion ^b	2.57	1.65	.24**	.001
Re-experience Emotions	5.07	1.49	-.43***	< .001
Recall Vividness	6.08	.98	-.39***	< .001

^a Higher score indicates an observer's (vs own) perspective

^b Higher score indicates a distanced (vs immersed) participant when recalling memory

Table 17.

Study 3: Results of ANCOVAs (Controlling for Distress)

Dependent Variable	Subjective Condition					Objective Condition				
	(Adjusted Mean, Standard Error)		F	df	p	(Adjusted Mean, Standard Error)		F	df	p
	Close	Far				Recent	Distant			
Past Negative Affect	5.76 (.10)	5.88 (.10)	.72	1, 178	.398	5.92 (.10)	5.73 (.11)	1.78	1, 178	.184
Past Importance	6.05 (.13)	5.99 (.13)	.10	1, 177	.747	5.99 (.12)	6.05 (.14)	.11	1, 177	.744
Present Negative Affect	4.46 (.16)	3.91 (.15)	6.22	1, 178	.014	4.49 (.15)	3.88 (.17)	7.43	1, 178	.007
Present Importance	4.64 (.20)	4.30 (.19)	1.56	1, 178	.213	4.82 (.19)	4.12 (.21)	21.14	1, 178	.015
Future Negative Affect	2.88 (.16)	2.55 (.15)	2.16	1, 178	.144	2.64 (.15)	2.79 (.17)	.45	1, 178	.504
Future Importance	3.26 (.21)	2.76 (.20)	3.02	1, 178	.084	2.97 (.19)	3.05 (.21)	.08	1, 178	.782
Recall Ease	6.43 (.12)	5.90 (.11)	10.34	1, 178	.002	6.26 (.11)	6.07 (.12)	1.38	1, 178	.242
Recall Perspective ^a	2.68 (.18)	3.00 (.17)	1.68	1, 178	.197	2.79 (.17)	2.89 (.18)	.14	1, 178	.705
Recall Immersion ^b	2.26 (.18)	2.87 (.17)	6.37	1, 178	.012	2.46 (.16)	2.66 (.18)	.66	1, 178	.419
Re-experience Emotions	5.30 (.16)	4.83 (.15)	4.81	1, 178	.030	5.31 (.15)	4.82 (.16)	5.06	1, 178	.026
Recall Vividness	6.30 (.10)	5.86 (.10)	9.77	1, 178	.002	6.16 (.10)	6.00 (.11)	1.29	1, 178	.258

No significant interactions between subjective and objective conditions ($p > .207$)

^a Higher score indicates an observer's (vs own) perspective

^b Higher score indicates a distanced (vs immersed) participant when recalling memory

Table 18.

Study 3: Results of ANOVAs (Not Controlling for Distress)

Dependent Variable	Subjective Condition					Objective Condition				
	(Mean, Standard Error)		<i>F</i>	<i>df</i>	<i>p</i>	(Mean, Standard Error)		<i>F</i>	<i>df</i>	<i>p</i>
	Close	Far				Recent	Distant			
Past Negative Affect	5.77 (.14)	5.91 (.13)	.52	1, 179	.471	5.79 (.13)	5.88 (.14)	.24	1, 179	.627
Past Importance	6.06 (.16)	6.01 (.15)	.06	1, 178	.809	5.88 (.15)	6.19 (.16)	2.06	1, 178	.153
Present Negative Affect	4.47 (.17)	3.92 (.16)	5.68	1, 179	.018	4.43 (.15)	3.95 (.17)	4.42	1, 179	.037
Present Importance	4.65 (.21)	4.31 (.20)	1.36	1, 179	.245	4.74 (.19)	4.23 (.21)	3.14	1, 179	.078
Future Negative Affect	2.88 (.16)	2.56 (.16)	2.05	1, 179	.154	2.60 (.15)	2.84 (.17)	2.52	1, 179	.298
Future Importance	3.26 (.21)	2.77 (.20)	2.80	1, 179	.096	2.90 (.20)	3.13 (.22)	.59	1, 179	.443
Recall Ease	6.43 (.12)	5.90 (.11)	10.36	1, 179	.002	6.26 (.11)	6.07 (.12)	1.53	1, 179	.262
Recall Perspective ^a	2.68 (.18)	3.00 (.17)	4.46	1, 179	.205	2.83 (.17)	2.85 (.18)	.01	1, 179	.918
Recall Immersion ^b	2.26 (.18)	2.86 (.17)	6.13	1, 179	.014	2.50 (.16)	2.61 (.18)	.19	1, 179	.660
Re-experience Emotions	5.30 (.16)	4.84 (.15)	4.54	1, 179	.034	5.26 (.15)	4.87 (.16)	3.22	1, 179	.074
Recall Vividness	6.30 (.10)	5.86 (.10)	9.41	1, 179	.002	6.14 (.10)	6.03 (.11)	.52	1, 179	.450

No significant interactions between subjective and objective conditions ($p > .166$)

^a Higher score indicates an observer's (vs own) perspective

^b Higher score indicates a distanced (vs immersed) participant when recalling memory

Table 19.

Study 3: Regression Analysis of Objective and Subjective Time on Reactions to Past Failure – Objectively Recent, Feels Recent

Dependent Variable	Objective Time (Step 1)				Subjective Time (Step 2)			
	β	p	95% CI	R ²	β	p	95% CI	R ² Change
Past Negative Affect	-.11	.458	[-.03, .01]	.01	-.20	.201	[-.03, .01]	.04
Past Importance	.04	.784	[-.02, .03]	.002	-.02	.923	[-.02, .02]	.0002
Present Negative Affect	-.07	.647	[-.02, .02]	.01	-.48	< .001	[-.05, -.01]	.22
Present Importance	.01	.944	[-.02, .02]	.0001	-.37	.012	[-.05, -.01]	.13
Future Negative Affect	.04	.771	[-.02, .03]	.002	-.39	< .001	[-.05, -.01]	.14
Future Importance	.19	.193	[-.01, .05]	.04	-.02	.906	[-.03, .03]	.0001
Recall Ease	-.16	.279	[-.02, .01]	.03	-.16	.287	[-.02, .01]	.03
Recall Perspective ^a	.26	.080	[-.002, .04]	.07	.16	.269	[-.01, .03]	.03
Recall Immersion ^b	-.06	.666	[-.02, .02]	.004	.07	.642	[-.02, .02]	.01
Re-experience Emotions	.01	.939	[-.02, .02]	.0001	-.28	.061	[-.03, .001]	.08
Recall Vividness	-.11	.459	[-.01, .01]	.01	-.29	.051	[-.02, .0001]	.08

^a Higher score indicates an observer's (vs own) perspective

^b Higher score indicates a distanced (vs immersed) participant when recalling memory

Table 20.

Study 3: Regression Analysis of Objective and Subjective Time on Reactions to Past Failure – Objectively Recent, Feels Distant

Dependent Variable	Objective Time (Step 1)				Subjective Time (Step 2)			
	β	p	95% CI	R ²	β	p	95% CI	R ² Change
Past Negative Affect	-.08	.693	[-.02, .01]	.01	-.10	.511	[-.02, .01]	.01
Past Importance	.06	.688	[-.01, .02]	.003	-.14	.337	[-.02, .01]	.02
Present Negative Affect	-.10	.505	[-.02, .01]	.01	-.54	< .001	[-.04, -.02]	.28
Present Importance	.03	.827	[-.02, .03]	.001	-.47	.001	[-.05, -.01]	.20
Future Negative Affect	-.02	.869	[-.02, .02]	.001	-.33	.025	[-.03, -.002]	.10
Future Importance	.07	.616	[-.01, .02]	.01	-.34	.018	[-.04, -.004]	.11
Recall Ease	-.19	.195	[-.02, .01]	.03	-.22	.134	[-.02, .003]	.05
Recall Perspective ^a	-.07	.622	[-.03, .02]	.01	-.12	.418	[-.03, .02]	.01
Recall Immersion ^b	.05	.737	[-.02, .03]	.002	.24	.107	[-.004, .04]	.05
Re-experience Emotions	-.31	.025	[-.04, -.003]	.10	-.54	< .001	[-.05, -.02]	.28
Recall Vividness	-.13	.361	[-.02, .01]	.02	-.37	.011	[-.03, -.004]	.13

^a Higher score indicates an observer's (vs own) perspective

^b Higher score indicates a distanced (vs immersed) participant when recalling memory

Table 21.

Study 3: Regression Analysis of Objective and Subjective Time on Reactions to Past Failure – Objectively Distant, Feels Recent

Dependent Variable	Objective Time (Step 1)				Subjective Time (Step 2)			
	β	p	95% CI	R ²	β	p	95% CI	R ² Change
Past Negative Affect	-.20	.226	[-.003, .001]	.04	-.37	.022	[-.03, -.002]	.14
Past Importance	-.36	.028	[-.004, -.0003]	.13	-.37	.017	[-.03, -.003]	.13
Present Negative Affect	-.13	.424	[-.004, .002]	.02	-.47	.003	[-.05, .01]	.22
Present Importance	-.22	.177	[-.01, .001]	.05	-.56	< .001	[-.07, -.02]	.32
Future Negative Affect	.03	.848	[-.003, .004]	.001	-.56	< .001	[-.06, -.02]	.31
Future Importance	-.09	.597	[-.01, .003]	.01	-.58	< .001	[-.07, -.03]	.34
Recall Ease	-.33	.046	[-.003, .001]	.11	-.24	.128	[-.02, .002]	.06
Recall Perspective ^a	.37	.024	[.001, .01]	.13	.03	.850	[-.02, .02]	.001
Recall Immersion ^b	.22	.195	[-.001, .004]	.05	.18	.280	[-.01, .03]	.03
Re-experience Emotions	-.16	.348	[-.004, .002]	.03	-.30	.069	[-.04, .001]	.09
Recall Vividness	-.51	.001	[-.004, -.001]	.26	-.47	< .001	[-.03, -.01]	.22

^a Higher score indicates an observer's (vs own) perspective

^b Higher score indicates a distanced (vs immersed) participant when recalling memory

Table 22.

Study 3: Regression Analysis of Objective and Subjective Time on Reactions to Past Failure – Objectively Distant, Feels Distant

Dependent Variable	Objective Time (Step 1)				Subjective Time (Step 2)			
	β	p	95% CI	R ²	β	p	95% CI	R ² Change
Past Negative Affect	.05	.759	[-.003, .01]	.002	-.07	.658	[-.02, .01]	.01
Past Importance	.03	.858	[-.003, .004]	.001	-.19	.219	[-.02, .01]	.04
Present Negative Affect	.11	.488	[-.003, .01]	.01	-.62	< .001	[-.05, -.02]	.39
Present Importance	.15	.316	[-.003, .01]	.02	-.50	< .001	[-.06, -.02]	.25
Future Negative Affect	.08	.622	[-.003, .01]	.01	-.44	.003	[-.04, -.01]	.19
Future Importance	.18	.223	[-.002, .01]	.03	-.37	.012	[-.04, -.01]	.14
Recall Ease	-.15	.343	[-.01, .002]	.02	.06	.685	[-.01, .02]	.004
Recall Perspective ^a	-.22	.155	[-.01, .001]	.05	.06	.685	[-.01, .02]	.004
Recall Immersion ^b	-.29	.057	[-.01, .0001]	.08	.27	.060	[-.001, .03]	.08
Re-experience Emotions	.14	.354	[-.002, .01]	.02	-.39	.008	[-.03, -.01]	.15
Recall Vividness	-.01	.955	[-.003, .003]	< .001	-.22	.147	[-.02, .003]	.05

^a Higher score indicates an observer's (vs own) perspective

^b Higher score indicates a distanced (vs immersed) participant when recalling memory

Appendices

Appendix A: Study 1A & 1B Materials

Premeasures: Implicit Theories, Rosenberg Self-Esteem, Locus of Control, and Dialectical Thought (combined)

Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements, as they apply to yourself, by selecting the number that corresponds to your opinion in the space underneath each statement.

[6-point scale: Strongly Disagree; Disagree; Somewhat Disagree; Somewhat Agree; Agree; Strongly Agree]

On the whole, I am satisfied with myself.

Whether or not I get to be a leader depends mostly on my ability.

In making decisions, I compare various viewpoints of others to construct my own view.

At times, I think I am no good at all.

People's moral character is something basic about them and they can't change it much.

I feel that I have a number of good qualities.

To a great extent my life is controlled by accidental happenings.

I am able to do things as well as most other people.

There is not much that can be done to change people's moral traits (e.g., uprightness and honesty).

[To show that you are paying attention to these questions, please choose 'strongly disagree' for this question.]

To make a commitment, I need to contrast two or more possible options.

I feel I do not have much to be proud of.

The kind of person someone is, is something very basic about them and it can't be changed very much.

I feel like what happens in my life is mostly determined by powerful people.

I certainly feel useless at times.

Considering opposite viewpoints assists me in understanding myself.

People can do things differently, but the important parts of who people are can't really be changed.

I can pretty much determine what will happen in my life.

I feel that I'm a person of worth, at least on an equal plane with others.

[To show that you are paying attention to these questions, please choose 'strongly agree' for this question.]

I often weigh both the good and the bad aspects of any situation or experience.

Whether someone is responsible and sincere or not is deeply ingrained in their personality. It cannot be changed very much.

People like myself have very little chance of protecting our personal interests when they conflict with those of strong pressure groups.

I wish I could have more respect for myself.

Comparing the implications of conforming versus rebelling helps me make a moral choice.

Everyone is a certain kind of person and there is not much that can be done to really change that.

All in all, I am inclined to feel that I am a failure.

Often there is no chance of protecting my personal interests from bad luck happenings.

I take a positive attitude toward myself.

Attachment Style

Please read each of the following statements and rate the extent to which you believe each statement best describes your feelings about close relationships in general.

[6-point scale: Strongly Disagree; Disagree; Somewhat Disagree; Somewhat Agree; Agree; Strongly Agree]

It helps to turn to people in times of need.

I usually discuss my problems and concerns with others.

I talk things over with people.

I find it easy to depend on others.

I don't feel comfortable opening up to others.

I prefer not to show others how I feel deep down.

I often worry that other people do not really care for me.

I'm afraid that other people may abandon me.

I worry that others won't care about me as much as I care about them.

Study Qualifier Questions

Are you currently in a romantic relationship? Yes; No

How many romantic relationships have you been in during your life, including any at present?
[dropdown, individual numbers 0-9, and then 10+]

[All participants who had at least two breakups (thus, those who were not in a relationship and who had at least two relationships, or who were in a relationship and who had at least three relationships) were routed into Study 1A; all participants who had less than two breakups were routed into Study 1B]

Relationship Questions (if currently in a relationship)

How long have you had a relationship with your current partner? Please specify the number of months and years - estimate as accurately as you can. Example: If you have been in a relationship with your partner for about one year and four months, you would enter '1' into the first box ('Years') and '4' into the second box ('Months').

Years (e.g., 1 year, 2 years, 0 years): [text entry]

Months (e.g., 6 months - do not include the number of years in this - e.g., if you have been with your partner for 1 year and 6 months, put 1 year above and 6 months here, not 18 months here):
[text entry]

What is your partner's gender? Male; Female; Other (please specify) [text entry]

How satisfied are you with this relationship?

[8-point scale: Very Dissatisfied – Very Satisfied]

How content are you with this relationship?

[8-point scale: Very Discontent – Very Content]

How happy are you with this relationship?

[8-point scale: Very Unhappy – Very Happy]

How close are you with your partner?

[8-point scale: Very Distant – Very Close]

Study Instructions/Measures: STUDY 1A

Now we would like you to think about **your most recent [first] romantic break-up**. Think about the events that transpired, words that were said, and your emotions at the time.

We would like you to write about this event. In your description of the event, please try to include as many details as you are comfortable providing. [text entry]

Approximately when did this occur? (If you can't remember accurately, please give your best estimate). Please state the month (e.g., September), and the year (e.g., 2013) that this occurred.

e.g.: September 2013 [text entry]

How long had you been in a relationship with this person at the time of the breakup? Please specify the number of months and years - estimate as accurately as you can. Example: If you had been in a relationship with this individual for about one year and four months, you would enter '1' into the first box ('Years') and '4' into the second box ('Months').

Years (e.g., 1 year, 2 years, 0 years): [text entry]

Months (e.g., 6 months - do not include the number of years in this - e.g., if you had been with this individual for 1 year and 6 months, put 1 year above and 6 months here, not 18 months here): [text entry]

Dependent Variables: STUDY 1A

Sometimes events tend to *feel* closer or further away, regardless of how long ago it actually occurred. Think about the event that you described for this study. Place the slider at the point that best indicates how long ago that event feels to you.

[slider bar, on 100-point scale (numbers not visible), with the following on either end]

Feels very close – Feels very far away

Feels like yesterday – Feels very distant

[Following items on 7-point scale, with endpoints Not at all and Extremely]

Think back to your feelings immediately after the breakup you described above. How upset did you feel about this breakup at the time it occurred?

How angry were you about this breakup at the time it occurred?

How hurt were you by this breakup at the time it occurred?

How happy were you about this breakup at the time it occurred?

How important was this breakup to you at the time it occurred?

How much did you desire this breakup at the time it occurred?

Think about this break-up, and how it compares to other break-ups you have gone through in your life. Compared to other experiences, was this breakup:

[bipolar variables on 7-point scale]

Easier - Harder

More emotional - Less emotional

More memorable - Less memorable

More positive - More negative

[Following items on 7-point scale, with endpoints Not at all and Extremely]

Think about the breakup you described previously, and your feelings about it at this moment.
How upset do you feel about this breakup at present?

How angry are you about this breakup at present?

How hurt are you by this breakup at present?

How happy are you about this breakup at present?

How important is this breakup to you at present?

Please think about the person with whom you broke up, and give your judgments of that person on the following dimensions. To what degree is this specific person:

[bipolar variable on 7-point scale]

Immoral - Moral

Good - Bad

Trustworthy - Untrustworthy

Likeable - Unlikeable

[Following items on 7-point scale, with endpoints Not at all and Extremely]

Imagine yourself one year in the future, thinking back about this breakup. How upset do you think you will feel about this breakup one year in the future?

How angry do you think you will be about this breakup one year in the future?

How hurt do you think you will be by this breakup one year in the future?

How happy do you think you will be about this breakup one year in the future?

How important will this breakup be to you one year in the future?

How often do you think about this breakup?

[Seven-point scale, with endpoints Not Often at All and Extremely Often]

When recalling this breakup, to what extent did you see the event unfold from your own perspective (as if through your own eyes) versus watched the event unfold as an observer would (as an outside onlooker would)?

[Seven-point scale, with endpoints From my own perspective only and From an observer's perspective only, and midpoint From both perspectives equally]

To what extent did you feel like an immersed participant versus a distanced observer when recalling the breakup?

[Seven-point scale, with endpoints Predominantly like an immersed participant and Predominantly like a distanced observer]

How much do you agree with the following statement: I re-experience the emotions I originally felt during the breakup when I think about it now.

[Seven-point scale, with endpoints Strongly Disagree and Strongly Agree]

How much do you agree with the following statement: As I think about the breakup now, my emotions and physical reactions to the event are still pretty intense.

[Seven-point scale, with endpoints Strongly Disagree and Strongly Agree]

How easy or difficult was it for you to recall the factual details of this breakup?

[Seven-point scale, with endpoints Very Difficult and Very Easy]

Do you have an ongoing relationship with this person?

[Dropdown menu, with options Yes, a romantic involvement; Yes, a friendship; Yes, acquaintances, No relationship; Other]

How close are you with this person currently?

[Seven-point scale, with endpoints Very Distant and Very Close]

Study Instructions/Measures: STUDY 1B

Now we would like you to think about your most recent birthday [your birthday three years ago (that is, if you are currently 20, think about your 17th birthday)], both the actual day and any celebrations around that time. Think about the events that occurred in that period, people who you interacted with, and your emotions at the time.

We would like you to write about this event. In your description of the event, please try to include as many details as you are comfortable providing.

When did this occur? Please state the date (e.g. 22), month (e.g., September), and the year (e.g., 2013) that this occurred. [text entry]

Dependent Variables: STUDY 1B

Sometimes events tend to *feel* closer or further away, regardless of how long ago it actually occurred. Think about the event that you described for this study. Place the slider at the point that best indicates how long ago that event feels to you.

[slider bar, on 100-point scale (numbers not visible), with the following on either end]

Feels very close – Feels very far away

Feels like yesterday – Feels very distant

[Following items on 7-point scale, with endpoints Not at all and Extremely]

Think back to your feelings during and immediately after the birthday you described above. How happy did you feel about this birthday at the time it occurred?

How loved did you feel in relation to this birthday at the time it occurred?

How upset did you feel about this birthday at the time it occurred?

How disappointed did you feel about this birthday at the time it occurred?

How important was this birthday to you at the time it occurred?

Think about this birthday, and how it compares to other birthdays you have had in recent years. Compared to other experiences, was this birthday:

[bipolar variables on 7-point scale]

More fun – Less fun

More emotional – Less emotional

More positive – More negative

More memorable – Less memorable

[Following items on 7-point scale, with endpoints Not at all and Extremely]

Think about the birthday you described previously, and your feelings about it at this moment.
How happy do you feel about this birthday at present?

How loved do you feel in regards to this birthday at present?

How upset do you feel about this birthday at present?

How disappointed do you feel about this birthday at present?

How important is this birthday at present?

Imagine yourself one year in the future, thinking back about this birthday. How happy do you think you will feel about this birthday one year in the future?

How loved do you think you will feel in regards to this birthday one year in the future?

How upset do you think you will feel about this birthday one year in the future?

How disappointed do you think you will feel about this birthday one year in the future?

How important will this birthday be one year in the future?

How often do you think about this birthday?

[Seven-point scale, with endpoints Not Often at All and Extremely Often]

When recalling this birthday, to what extent did you see the event unfold from your own perspective (as if through your own eyes) versus watched the event unfold as an observer would (as an outside onlooker would)?

[Seven-point scale, with endpoints From my own perspective only and From an observer's perspective only, and midpoint From both perspectives equally]

To what extent did you feel like an immersed participant versus a distanced observer when recalling the birthday?

[Seven-point scale, with endpoints Predominantly like an immersed participant and Predominantly like a distanced observer]

How much do you agree with the following statement: I re-experience the emotions I originally felt during this birthday when I think about it now.

[Seven-point scale, with endpoints Strongly Disagree and Strongly Agree]

How much do you agree with the following statement: As I think about this birthday now, my emotions and physical reactions to the event are still pretty intense.

[Seven-point scale, with endpoints Strongly Disagree and Strongly Agree]

How easy or difficult was it for you to recall the factual details of this birthday?

[Seven-point scale, with endpoints Very Difficult and Very Easy]

Post-Measures (Study 1a and 1b)

Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements, as they apply to yourself, by selecting the number that corresponds to your opinion in the space underneath each statement.

[Six-point scale: Strongly Disagree, Disagree, Somewhat Disagree, Somewhat Agree, Agree, Strongly Agree]

People cannot change themselves, but are only changed by outside forces like life experiences.

When a person changes, it's because they're consciously trying to change themselves.

Everyone's personality is in a state of flux, and is always being shaped and changed.

In general, no one ever changes unless they absolutely have to.

Change usually means people are developing or growing.

Change usually just means people are being inconsistent or unpredictable.

When someone does not change, it means that they are solid and dependable.

When someone does not change, it means that they are stagnating or at a standstill.

Usually, when someone changes their mind, it's because their thinking has grown or evolved.

Usually, when someone changes their mind, it's because they're flighty or indecisive.

[To show that you are paying attention to these questions, please choose 'somewhat disagree' for this question.]

When things change, it is usually for the better.

When things change, it is usually random or chaotic

When things change, it is usually for the worse.

When things do not change, I feel safe.

When things do not change, I feel bored.

Demographics

Please complete the following questions:

Age: [text entry]

Gender: Male; Female; Other (please specify) [text entry]

In which country do you reside? [dropdown with all countries]

Ethnicity you identify with the most: Chinese; South Asian (e.g., East Indian, Pakistani, Punjabi, Sri Lankan); Black (e.g., African, Haitian, Jamaican, Somali); Arab; West Indian (e.g., Armenian, Egyptian, Iranian, Lebanese, Moroccan); Filipino; South East Asian (e.g., Cambodian, Indonesian, Laotian); Hispanic; Japanese; Korean; Caucasian; Other (please specify) [text entry]

First language: [text entry]

Political leaning: Very liberal; Somewhat liberal; Moderate; Somewhat conservative; Very conservative; Libertarian; None/uninterested; Other (please specify) [text entry]

Religious affiliation or belief system: No religious affiliation; Christian (e.g. Catholic, Protestant, Lutheran); Muslim (e.g. Shia, Sunni); Jewish (e.g. Orthodox, Reform); Hindu; Sikh; Atheist; Agnostic; Buddhist; Spiritual but not religious; Other (please specify) [text entry]

How important is your religious affiliation or belief system to you?

[7-point scale: Not at all Important; Very Unimportant; Somewhat Unimportant; Neither Important nor Unimportant; Somewhat Important; Very Important; Extremely Important]

When conducting research, we rely on participants' responses being honest and accurate in order for us to draw valid conclusions from the data. However, we recognize that there are many reasons participants might be unable or unwilling to provide fully honest and accurate responses. In these cases it is truly helpful for us to be able to identify responses that may not be valid so we can take this into account.

In your honest opinion, should we use your data from this survey?

Please note: your answer is confidential, and you will be compensated whichever answer you choose.

Yes; No

[if yes] Why do you think we should NOT use your data? [text entry]

Appendix B: Study 2 Materials

Premeasures: Dialectical Thought, Implicit Theories of Change, Rosenberg Self-Esteem

Dialectical Thought

For each of the items below, please indicate the extent to which you disagree or agree with each statement. Read each statement carefully; remember, there are no right or wrong answers.

[7-point scale: Strongly Disagree, Disagree, Somewhat Disagree, Neither Agree nor Disagree, Somewhat Agree, Agree, Strongly Agree]

In making decisions, I compare various viewpoints of others to construct my own view.

Considering opposite viewpoints assists me in understanding myself.

To make a commitment, I need to contrast two or more possible options.

I often weigh both the good and the bad aspects of any situation or experience.

Comparing the implications of conforming versus rebelling helps me make a moral choice.

Implicit Theories of Change

Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements, as they apply to yourself, by selecting the number that corresponds to your opinion in the space underneath each statement.

[6-point scale: Strongly Disagree, Disagree, Somewhat Disagree, Somewhat Agree, Agree, Strongly Agree]

People's moral character is something basic about them and they can't change it much.

Whether someone is responsible and sincere or not is deeply ingrained in their personality. It cannot be changed very much.

There is not much that can be done to change people's moral traits (e.g., uprightness and honesty).

People can learn new things, but they can't really change how ethical they are.

People can significantly change their basic moral character, no matter who they are.

People can't really change their level of integrity.

People can change even their most basic moral traits.

No matter what kind of person someone is, they can always change their moral character very much.

The kind of moral character a person has is something very basic about them, and it can't be changed very much.

People can always substantially change how principled of a person they are.

People's personalities are a part of who they are and they can't change very much.

People can always change their personality.

The kind of person someone is, is something very basic about them and it can't be changed very much.

People can do things differently, but the important parts of who people are can't really be changed.

People can significantly change their basic characteristics, no matter who they are.

[Please respond by choosing 'Disagree' for this question.]

As much as people hate to admit it, you can't teach an old dog new tricks. People can't really change their deepest attributes.

People can always substantially change the kind of person they are.

People are certain kinds of people, and there is not much that can be done to really change that.

No matter what kind of person someone is, they can always change very much.

People can change even their most basic qualities.

Rosenberg Self-Esteem

Please indicate how much you agree with each statement below:

[4-point scale: Strongly Disagree, Disagree, Agree, Strongly Agree]

On the whole, I am satisfied with myself.

At times, I think I am no good at all.

I feel that I have a number of good qualities.

I am able to do things as well as most other people.

I feel I do not have much to be proud of.

I certainly feel useless at times.

I feel that I'm a person of worth, at least on an equal plane with others.

I wish I could have more respect for myself.

All in all, I am inclined to feel that I am a failure.

I take a positive attitude toward myself.

Study Instructions/Measures

First, we would like you to think about someone with whom you have a personal relationship. This could be a friend, family member, romantic partner, or anyone else with whom you have a relationship. This should be a person you have known for at least one year, and should be someone with whom you have an ongoing relationship; that is, you have not ended the relationship or ceased communication with that person.

Place the initials of the person you are thinking about in the space provided: ____

How long have you had a relationship with this person? Please specify the number of months and years - estimate as accurately as you can. Example: If you have known this person for about one year and four months, you would enter '1' into the first box ('Years') and '4' into the second box ('Months').

Years (e.g., 1 year, 2 years, 0 years):

Months (e.g., 6 months - do not include the number of years in this - e.g., if you have known the person for 1 year and 6 months, put 1 year above and 6 months here, not 18 months here):

Please state this person's gender: [Male, Female, Other (please specify)]

What is your primary relationship with this person? [Friend, Family member, Romantic partner, Coworker, Other (please specify)]

Relationship Attachment Styles

Please read each of the following statements concerning how you relate to the person you chose on the previous page. Please indicate the extent to which you agree or disagree with each statement.

[6-point scale: Strongly Disagree, Disagree, Somewhat Disagree, Somewhat Agree, Agree, Strongly Agree]

I usually discuss my problems and concerns with this person.

I talk things over with this person.

It helps to turn to this person in times of need.

I find it easy to depend on this person.

I prefer not to show this person how I feel deep down.

I don't feel comfortable opening up to this person.

I'm afraid this person may abandon me.

I worry that this person won't care about me as much as I care about him or her.

I often worry that this person doesn't really care for me.

Relationship Satisfaction

How satisfied are you with this relationship?

[7-point scale: Very Dissatisfied, Dissatisfied, Somewhat Dissatisfied, Neutral, Somewhat Satisfied, Satisfied, Very Satisfied]

How content are you with this relationship?

[7-point scale: Very Discontent, Discontent, Somewhat Discontent, Neutral, Somewhat Content, Content, Very Content]

How happy are you with this relationship?

[7-point scale: Very Unhappy, Unhappy, Somewhat Unhappy, Neutral, Somewhat Happy, Happy, Very Happy]

Study Instructions

Now we would like you to think about an event that occurred **in the past month [a year or more in the past]** in which the person that you previously selected did something that hurt or wronged you. We would like you to think about an interpersonal transgression or other negative incident committed by this person.

If you can't think of anything that happened within the requested time frame, please select an event that occurred as close as possible to that time period.

We would like you to write about this event. In your description of the event, please try to include as many details as you are comfortable providing.

Remember, we would like you to think of a relatively recent [distant] time that this other person hurt you in some way - within the past month [a year ago or more]. Please try your best to select something from that time frame.

[Text box]

Approximately when did this event occur? (If you can't remember accurately, please give your best estimate). Please state the day (e.g., 22), month (e.g., September), and the year (e.g., 2013) that this event occurred.

[Text entry]

Dependent Variables

[Following questions: 7-point scale, with endpoints 'Not at all' and 'Extremely']

Think back to your feelings immediately after the event you described above. How upset did you feel about this act at the time it occurred?

How angry were you about this act at the time it occurred?

How hurt were you by this act at the time it occurred?

How important was this event to you at the time it occurred?

Now think about your feelings at this moment. How upset do you feel about this act at present?

How angry are you about this act at present?

How hurt are you by this act at present?

How important is this event to you at present?

Think about how you may feel about this event in the future, one year from now. How upset do you think you will feel about this act one year in the future?

How angry do you think you will be about this act one year in the future?

How hurt do you think you will be by this act one year in the future?

How important will this act be to you one year in the future?

Please think about this person and give your judgments of that person in the present on the following dimensions. To what degree is this specific person: [all items on seven-point bipolar scale]

Immoral – Moral

Good – Bad

Trustworthy – Untrustworthy

Likeable – Unlikeable

You just indicated your judgment of your close other, looking back on an act they had committed a month ago or less [over a year ago]. Thinking back about the event, respond based on how you feel right now.

[Following questions: 7-point scale, with endpoints ‘Not At All’ and ‘A Lot’]

How much do you judge this person now based on their past act?

How much do you forgive this person now after their past act?

How much do you trust this person now after this past act?

For the following questions, think about the person you previously chose. How much do you agree or disagree with the following statements?

[Following questions: 7-point scale: Strongly Disagree, Disagree, Somewhat Disagree, Neither Agree nor Disagree, Somewhat Agree, Agree, Strongly Agree]

This person is unforgivable.

This person is a different person now than when they committed the act.

I have decreased contact with this person since their act.

My judgment of this person now is in no way affected by this act.

This person is completely trustworthy.

My relationship with this person is the same as it was before this act occurred.

I have avoided becoming closer with this person because of this event.

I have completely forgiven this person for their act.

Since this act, I have become closer with this person.

Think about the act you described earlier. How likely do you think it is that this person would repeat their earlier behavior again (i.e., hurt you in a similar way) in the future?

[7-point scale: Very Unlikely, Unlikely, Somewhat Unlikely, Neither Likely Nor Unlikely, Somewhat Likely, Likely, Very Likely]

Sometimes events tend to feel closer or further away, regardless of how long ago it actually occurred. Think about the act committed by this person in the past. Place the slider at the point that best indicates how long ago that act feels to you.

[slider bar, on 100-point scale (numbers not visible), with the following on either end]

Feels very close – Feels very far away

Feels like yesterday – Feels very distant

Think back to the act you described above. Please think about the act itself, rather than the person who committed the act, and give your judgments of the act in the present on the following dimensions. To what degree is this specific act [all items on seven-point bipolar scale]:

Immoral – Moral

Good – Bad

Serious – Not Serious

[Following items: 7-point scale, with labels Very Distant, Distant, Somewhat Distant, Neither Close nor Distant, Somewhat Close, Close, Very Close]

How close were you with this person before this act?

How close were you with this person immediately after this act?

How close are you with this person right now?

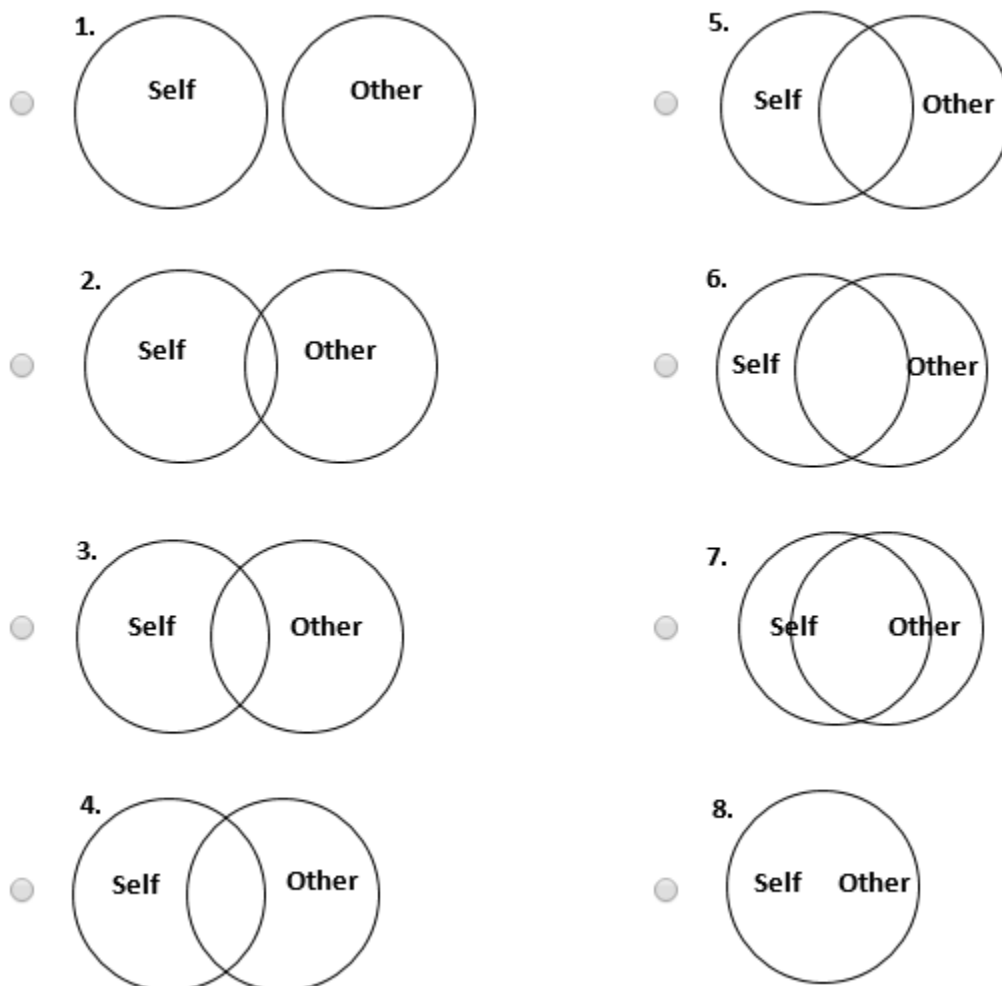
For the following questions, think about the circle labelled 'Self' as representing yourself, the circle labelled 'Other' as representing the person you have described, and their overlap as representing the closeness between yourself and the other person.

[Following items: scale as pictured below]

Please click next to the picture below which best describes how close you felt to the other person before the event you described occurred.

Please click next to the picture below which best describes how close you felt to the other person immediately after the event you described occurred.

Please click next to the picture below which best describes how close you currently feel to the other person.



[Following questions: 7-point scale, with endpoints ‘Not Often At All’ and ‘Extremely Often’]

How often have you brought up this past event with this person?

How often do you think about this event?

How easy or difficult was it for you to recall this event?

[7-pointing scale: Very Difficult, Difficult, Somewhat Difficult, Neutral, Somewhat Easy, Easy, Very Easy]

Think about the event you described. How likely do you think it is that this person could change?

[7-point scale: Very Unlikely, Unlikely, Somewhat Unlikely, Neither Likely Nor Unlikely, Somewhat Likely, Likely, Very Likely]

Indicate how much you agree or disagree with the following statement: This person is incapable of change.

[7-point scale: Strongly Disagree, Disagree, Somewhat Disagree, Neither Agree nor Disagree, Somewhat Agree, Agree, Strongly Agree]

Do you have an ongoing relationship with this person?

Yes No

To what extent do you believe that this person’s behavior was a result of:

[7-point scale, with endpoints Not at all – Extremely]

Something stable/consistent about him/her (i.e. the type of person that he/she is)

Something unstable/inconsistent about him/her (i.e. their mood)

Something stable/consistent about you (i.e. the type of person that you are)

Something unstable/inconsistent about you (i.e. your mood)

The external circumstances (stressed out about something else in his/her life)

Your relationship (i.e. the way you tend to interact when you’re together)

To what extent do you feel that this person's behavior:

[7-point scale, with endpoints Not at all – Extremely]

Was an isolated incident (i.e. a one-time thing)

Is part of a frequent pattern of behavior

Has occurred very frequently

Post-Measures

Implicit Theories: New Measures

Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements, as they apply to yourself, by selecting the number that corresponds to your opinion in the space underneath each statement.

[6-point scale: Strongly Disagree, Disagree, Somewhat Disagree, Somewhat Agree, Agree, Strongly Agree]

People cannot change themselves, but are only changed by outside forces like life experiences.

When a person changes, it's because they're consciously trying to change themselves.

Everyone's personality is in a state of flux, and is always being shaped and changed.

In general everyone can change themselves, but most people are unlikely to change.

Change usually means people are developing or growing.

Change usually just means people are being inconsistent or unpredictable.

TIPI

Below are a number of personality traits that may or may not apply to yourself. Using the following scale, please indicate the extent to which you agree or disagree with each statement. You should rate the extent to which the pair of traits applies to yourself, even if one characteristic applies more strongly than the other.

I see myself as:

[7-point scale: Strongly Disagree, Disagree, Somewhat Disagree, Neither Agree nor Disagree, Somewhat Agree, Agree, Strongly Agree]

Extraverted, enthusiastic

Critical, quarrelsome

Dependable, self-disciplined

Anxious, easily upset

Open to new experiences, complex

Reserved, quiet

Sympathetic, warm

Disorganized, careless

Calm, emotionally stable

Conventional, uncreative

Locus of Control

[6-point scale: Strongly Disagree, Disagree, Slightly Disagree, Slightly Agree, Agree, Strongly Agree]

Whether or not I get to be a leader depends mostly on my ability.

To a great extent my life is controlled by accidental happenings.

I feel like what happens in my life is mostly determined by powerful people.

Whether or not I get into a car accident depends mostly on how good a driver I am.

When I make plans, I am almost certain to make them work.

Often there is no chance of protecting my personal interests from bad luck happenings.

When I get what I want, it's usually because I'm lucky.

Although I might have good ability, I will not be given leadership responsibility without appealing to those in positions of power.

How many friends I have depends on how nice a person I am.

I have often found that what is going to happen will happen.

My life is chiefly controlled by powerful others.

[Please respond by choosing 'Slightly Agree' for this question.]

Whether or not I get into a car accident is mostly a matter of luck.

People like myself have very little chance of protecting our personal interests when they conflict with those of strong pressure groups.

It's not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad fortune.

Getting what I want requires pleasing those people above me.

Whether or not I get to be a leader depends on whether I'm lucky enough to be in the right place at the right time.

If important people were to decide they didn't like me, I probably wouldn't make many friends.

I can pretty much determine what will happen in my life.

I am usually able to protect my personal interests.

Whether or not I get into a car accident depends mostly on the other driver.

When I get what I want, it's usually because I worked hard for it.

[Please respond by choosing 'Strongly Disagree' for this question.]

In order to have my plans work, I make sure that they fit in with the desires of people who have power over me.

My life is determined by my own actions.

It's chiefly a matter of fate whether or not I have a few friends or many friends.

Demographics

Please complete the following questions:

Age: [text entry]

Gender: Male; Female; Other (please specify) [text entry]

In which country do you reside? [dropdown with all countries]

Ethnicity you identify with the most: Chinese; South Asian (e.g., East Indian, Pakistani, Punjabi, Sri Lankan); Black (e.g., African, Haitian, Jamaican, Somali); Arab; West Indian (e.g., Armenian, Egyptian, Iranian, Lebanese, Moroccan); Filipino; South East Asian (e.g., Cambodian, Indonesian, Laotian); Hispanic; Japanese; Korean; Caucasian; Other (please specify) [text entry]

First language: [text entry]

Political leaning: Very liberal; Somewhat liberal; Moderate; Somewhat conservative; Very conservative; Libertarian; None/uninterested; Other (please specify) [text entry]

Religious affiliation or belief system: No religious affiliation; Christian (e.g. Catholic, Protestant, Lutheran); Muslim (e.g. Shia, Sunni); Jewish (e.g. Orthodox, Reform); Hindu; Sikh; Atheist; Agnostic; Buddhist; Spiritual but not religious; Other (please specify) [text entry]

How important is your religious affiliation or belief system to you?

[7-point scale: Not at all Important; Very Unimportant; Somewhat Unimportant; Neither Important nor Unimportant; Somewhat Important; Very Important; Extremely Important]

When conducting research, we rely on participants' responses being honest and accurate in order for us to draw valid conclusions from the data. However, we recognize that there are many reasons participants might be unable or unwilling to provide fully honest and accurate responses. In these cases it is truly helpful for us to be able to identify responses that may not be valid so we can take this into account.

In your honest opinion, should we use your data from this survey?

Please note: your answer is confidential, and you will be compensated whichever answer you choose.

Yes; No

[if yes] Why do you think we should NOT use your data? [text entry]

Appendix C: Study 3 Materials

Pre-Measures

Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements, as they apply to yourself, by selecting the number that corresponds to your opinion in the space underneath each statement.

[Six-point scale: Strongly Disagree, Disagree, Somewhat Disagree, Somewhat Agree, Agree, Strongly Agree]

On the whole, I am satisfied with myself.

At times, I think I am no good at all.

I feel that I have a number of good qualities.

I am able to do things as well as most other people.

[To show that you are paying attention to these questions, please choose 'strongly disagree' for this question.]

I feel I do not have much to be proud of.

The kind of person someone is, is something very basic about them and it can't be changed very much.

I certainly feel useless at times.

People can do things differently, but the important parts of who people are can't really be changed.

I feel that I'm a person of worth, at least on an equal plane with others.

[To show that you are paying attention to these questions, please choose 'strongly agree' for this question.]

I wish I could have more respect for myself.

Everyone is a certain kind of person and there is not much that can be done to really change that.

All in all, I am inclined to feel that I am a failure.

I take a positive attitude toward myself.

Study Instructions and Materials

The study that you're about to participate in is about feelings, memory, and language. We're especially interested in how language and feelings interact in different people.

Throughout the course of this study, we will be asking you questions that have to do with feelings and providing you with instructions regarding how to think about experiences from your past.

It is important that you do your best to follow the instructions you receive throughout this study to the best of your ability. Although you may be asked to think about feelings and memories from your past in ways that you are not accustomed to, the validity of our research depends on your cooperation in following the exact instructions you receive as best as you can.

Now we would like you to think about an event that you consider a **personal failure** that occurred **approximately one month [year] ago in the past**. This could involve a time you failed to accomplish a goal, did poorly on a task, got negative feedback, or any other kind of event that felt like a failure. It could be related to a personal goal, work, school, home, family, relationship, competition, or any other domain - as long as you considered it a personal failure.

If you can't think of anything that happened **one month [year] in the past**, please select an event that occurred as close as possible to that time period.

Approximately when did this event occur? Please specify day, month and year - estimate as accurately as you can. Example: If the event occurred on December 1st, 2015, you would select '1' in the first column ('Day'), 'December' in the second column ('Month'), and '2015' in the third column ('Year').

[Dropdown menus for Day, Month, Year]

To what extent was the event distressing to you at the time, when it originally occurred?

[Seven-point scale with endpoints Not at all and Very much so]

[Subjective time manipulation: recent]

We would like you to tell the story about what happened during this failure incident. We would like you to tell the story in a particular way: as though it was happening right now, in the present

moment. That is, use the present tense when telling the story, and narrate the event as though you were living through it right now, at this very moment.

We will give you the beginning of a sentence to start your story. Use this to start your story, and continue your story in a similar way. For example, use phrases such as, "at this very moment, I am doing..." or "right now, I feel like...".

Please write about the incident below, using the instructions provided. Your story should begin as follows:

"At this moment, I am..."

[text entry]

[Subjective time manipulation: distant]

We would like you to tell the story about what happened during this failure incident. We would like you to tell the story in a particular way: some time has passed now since the event occurred, so we would like you to situate this incident clearly in the past. That is, use the past tense when telling the story, and narrate the event in a way that reflects that you are looking back on a past incident.

We will give you the beginning of a sentence to start your story. Use this to start your story, and continue your story in a similar way. For example, use phrases such as, "in the past, I was..." or "back then, I felt like...".

Please write about the incident below, using the instructions provided. Your story should begin as follows:

"In the past, I was..."

[text entry]

Manipulation check

Think about the incident you described. Place the slider at the point that best indicates how long ago that event feels to you.

[slider bar, on 100-point scale (numbers not visible), with the following on either end]

Feels very close – Feels very far away

Feels like yesterday – Feels very distant

Dependent Variables

[Items below on a 7-point scale, with endpoints Not at all – Extremely]

Think about the event you described previously, and your feelings about it at this moment. How upset do you feel about this event at present?

How worried are you about this event at present?

How disappointed do you feel about this event at present?

How ashamed are you of this event at present?

How distressed are you about this event at present?

How important is this event to you at present?

Think about how you may feel about this incident in the future, one year from now. How upset do you think you will feel about this event one year in the future?

How worried do you think you will be about this event one year in the future?

How disappointing do you think you will find this event one year in the future?

How ashamed do you think you will be of this event one year in the future?

How distressed do you think you will be about this event one year in the future?

How important will this event be to you one year in the future?

Think back to your feelings immediately after the incident you described above. How upset did you feel about this event at the time it occurred?

How worried were you about this event at the time it occurred?

How disappointing did you find this event at the time it occurred?

How ashamed were you of this event at the time it occurred?

How distressed were you about this event at the time it occurred?

How important was this event to you at the time it occurred?

How easy or difficult was it for you to recall the factual details of this event?

[Seven-point scale, with endpoints Very Difficult and Very Easy]

When recalling this event, to what extent did you see it unfold from your own perspective (as if through your own eyes) versus watched the event unfold as an observer would (as an outside onlooker would)?

[Seven-point scale, with endpoints From my own perspective only and From an observer's perspective only, and midpoint From both perspectives equally]

To what extent did you feel like an immersed participant versus a distanced observer when recalling the event?

[Seven-point scale, with endpoints Predominantly like an immersed participant and Predominantly like a distanced observer]

How much do you agree with the following statement: I re-experience the emotions I originally felt during this event when I think about it now.

[Seven-point scale, with endpoints Strongly Disagree and Strongly Agree]

To show that you are paying attention to these questions, please choose 'strongly disagree' for this question.

[Seven-point scale, with endpoints Strongly Disagree and Strongly Agree]

How vividly do you remember the details of this event?

[Seven-point scale, with endpoints Strongly Disagree and Strongly Agree]

Demographics

Please complete the following questions:

Age: [text entry]

Gender: Male; Female; Other (please specify) [text entry]

Ethnicity you identify with the most: South Asian (e.g., East Indian, Pakistani, Punjabi, Sri Lankan; Black (e.g., African, Haitian, Jamaican, Somali); Arab; West Indian (e.g., Armenian, Egyptian, Iranian, Lebanese, Moroccan); Asian; Hispanic; Caucasian; Aboriginal; Other (please specify) [text entry]

First language: [text entry]

Political leaning: Very liberal; Liberal; Somewhat liberal; Neither liberal nor conservative; Somewhat conservative; Conservative; Very conservative

Religious affiliation or belief system: No religious affiliation; Christian (e.g. Catholic, Protestant, Lutheran); Muslim (e.g. Shia, Sunni); Jewish (e.g. Orthodox, Reform); Hindu; Sikh; Atheist; Agnostic; Buddhist; Spiritual but not religious; Other (please specify) [text entry]

How important is your religious affiliation or belief system to you?

[7-point scale: Not at all Important; Very Unimportant; Somewhat Unimportant; Neither Important nor Unimportant; Somewhat Important; Very Important; Extremely Important]

When conducting research, we rely on participants' responses being honest and accurate in order for us to draw valid conclusions from the data. However, we recognize that there are many reasons participants might be unable or unwilling to provide fully honest and accurate responses. In these cases it is truly helpful for us to be able to identify responses that may not be valid so we can take this into account.

In your honest opinion, should we use your data from this survey?

Please note: your answer is confidential, and you will be compensated whichever answer you choose.

Yes; No

[if yes] Why do you think we should NOT use your data? [text entry]